

Bigger and Better - Excel 2.2 and Omnis 5

MacUSER
LABS

12 EXPERT SYSTEMS

\$2.95
\$3.95 CANADA

MacUser

SEPTEMBER 1989

16 PostScript Printers

Speed • Precision • Clones • Fonts • Memory • RISC

Mac Font Guide

- Bit-Map vs. PostScript
- 10,000 New Styles
- Apple's Outline Fonts

Boardroom Boredom?

Animate Your Presentations

Our New NetWorkShop Connectivity Lab Rates

Novell's NetWare

New Power Tools How-to Section!

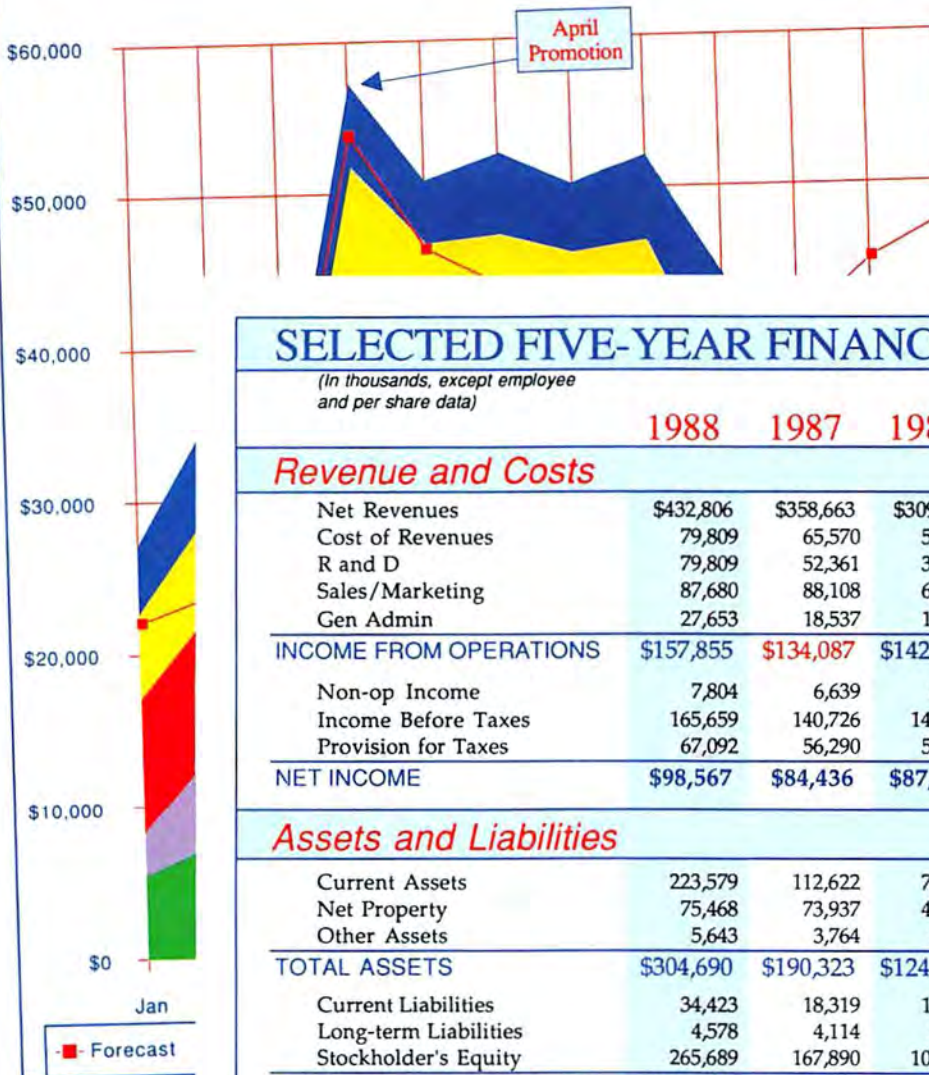
- Finder Alternatives
- Keyboard Repairs
- Customized Systems

PLUS HOT NEW MAC
REVIEWS

*Nexpert, Business Sense,
Voyager, TableTools,
SmartForm . . . and more!*



Monthly Profit By Product Line



SELECTED FIVE-YEAR FINANCIAL DATA

(In thousands, except employee and per share data)

	1988	1987	1986	1985	1984
Revenue and Costs					
Net Revenues	\$432,806	\$358,663	\$309,266	\$239,656	\$207,907
Cost of Revenues	79,809	65,570	58,344	40,710	40,215
R and D	79,809	52,361	33,081	21,420	20,676
Sales/Marketing	87,680	88,108	62,490	48,999	26,409
Gen Admin	27,653	18,537	12,594	7,306	4,520
INCOME FROM OPERATIONS	\$157,855	\$134,087	\$142,756	\$121,221	\$116,088
Non-op Income	7,804	6,639	3,715	2,008	1,387
Income Before Taxes	165,659	140,726	146,471	123,229	117,475
Provision for Taxes	67,092	56,290	59,321	49,908	47,577
NET INCOME	\$98,567	\$84,436	\$87,150	\$73,321	\$69,898
Assets and Liabilities					
Current Assets	223,579	112,622	79,282	44,256	44,055
Net Property	75,468	73,937	41,209	24,957	19,374
Other Assets	5,643	3,764	3,673	2,402	1,899
TOTAL ASSETS	\$304,690	\$190,323	\$124,164	\$71,615	\$65,327
Current Liabilities	34,423	18,319	11,599	5,077	9,940
Long-term Liabilities	4,578	4,114	3,602	3,293	3,146
Stockholder's Equity	265,689	167,890	108,964	63,245	52,242
TOTAL LIABILITIES & EQUITY	\$304,690	\$190,323	\$124,164	\$71,615	\$65,327
Working Capital	189,642	173,468	127,766	119,489	77,041
Number of Employees	3,456	2,727	1,681	1,390	1,086
Common Stock Data					
Net Income per Share	\$1.13	\$1.64	\$1.94	\$1.90	\$2.59
Book Value per Share	\$4.56	\$3.56	\$2.29	\$1.46	\$0.78
Cash and Investments	\$2.65	\$1.60	\$0.83	\$0.64	\$0.48
Average Shares Out	87,535	83,258	44,956	38,634	26,984
Shares Out/Year-end	86,790	51,305	26,589	15,905	9,082
Key Ratios					
Return on Net Revenues	23%	23%	28%	31%	34%
Return on Total Assets	32%	44%	70%	102%	107%
Return on Stock Equity	37%	50%	80%	116%	134%

As you can see, there's more than one way to highlight: Now pick from 256 fonts. Change row height. Shade. And get used to the sound of applause.

So have we. Introducing Microsoft Excel 2.2.

Back in 1985, not long after the Macintosh® was unveiled, Microsoft® Excel became the most compelling reason to buy one.

Within minutes, it was the spreadsheet standard on the Macintosh. And before we knew it, a full 9 out of 10 Macintosh spreadsheet users were swearing by it.

They still are.

But while many consider Microsoft Excel to be one incredible spreadsheet, we've been working on a way to change all that. The result: Microsoft Excel version 2.2 has just come to the small screen.

In simple mathematical terms, let's just say that 2.2 is greater than 1.5. In more technical terms, let's just say that now your spreadsheets aren't limited to 1MB of memory — version 2.2 taps every ounce of power from even the 8meg machines. Which means very soon you'll be creating spreadsheets of outrageous proportions.

Equally outrageous is how much faster you'll be able to perform your calculations: Try up to 40% faster, thanks

to our advanced intelligent recalc.

As for presentation? Version 2.2 lets you highlight data in ways you never could before: You can pick from 256 different fonts per sheet, including up to six styles and eight colors. You can change row height. You can shade. And basically pack your documents with more visual punch than ever before.

You can also add notes to any cell on a worksheet, or macro-sheet, so key assumptions are documented — and printable. Plus, thanks to our new built-in tools, you can even audit things like cell precedents and dependents.

Microsoft Excel version 2.2. Another improvement designed to make Mac® enthusiasts even more enthusiastic. Something 90% of you are already used to.

And you other 10% easily can be.

Microsoft
Making it all make sense.



Used to be, 1MB was enough. Now with Microsoft Excel 2.2, you can take full advantage of the 8 megs in today's most powerful Macintoshes.



90% of Macintosh
spreadsheet users
have been working
on this program.

File Edit Formula Format Data Options Macro Window					
128					
Financials-MS Excel 1.5 doc					
Selected Five - Year Financial Data					
<i>(In thousands, except employee and per share data)</i>					
	1988	1987	1986	1985	1984
Revenue and Costs					
Net Revenues	\$432,806	\$318,663	\$309,266	\$239,656	\$207,907
Cost of Revenues	79,809	165,570	58,344	40,710	40,215
R and D	79,809	52,361	33,081	21,420	20,676
Sales/Marketing	87,680	88,108	62,490	48,999	26,409
Gen Admin	27,653	18,537	12,594	7,306	4,520
Income from Operations	\$157,855	(\$5,913)	\$142,756	\$121,221	\$116,088
Non-op Income	7,804	6,639	3,715	2,008	1,387
Income Before Taxes	165,659	726	146,471	123,229	117,475
Provision for Taxes	67,092	294	59,321	49,908	47,577
Net Income	\$98,567	\$432	\$87,150	\$73,321	\$69,898
Assets and Liabilities					
Current Assets	223,579	112,622	79,282	44,256	44,055
Net Property	75,468	73,937	41,209	24,957	19,374
Other Assets	5,643	3,764	3,673	2,402	1,899
Total Assets	\$304,690	\$190,323	\$124,164	\$71,615	\$65,327
Current Liabilities	34,423	18,319	11,599	5,077	9,940
Long-term Liabilities	4,578	4,114	3,602	3,293	3,146
Stockholder's Equity	265,689	167,890	108,964	63,245	52,242
Total Liabilities and Equity	\$304,690	\$190,323	\$124,164	\$71,615	\$65,327



Macintosh IIx

MacUser

Features

Presentations with Punch

BY SALVATORE PARASCANDOLO AND KRISTI COALE

Dreary slide shows can be the death of a sales pitch, but animated presentations will have the audience glued to their seats. We examine two powerful new tools for making a moving presentation — MacroMind Director and Studio/1 — that will transform your boardroom from dullsville to Disneyland. **92**

Fonts from A to Z

BY STEVE MCKINSTRY

Everybody loves them, but nobody understands them. Here's the whole font story: how type works, where to get the right face, and the fundamentals of good type design. Also, simple (but lifesaving) utilities for font management and manipulation and how to avoid hidden hazards. **120**



The Mac can finally play with the giant of the PC networking world: Novell's NetWare. Page 165

The Expert Is In

BY DANIEL RASMUS

Put an expert to work. Expert systems can turn the Mac into a reasoning machine that will do whatever you want it to — from diagnosing diseases to routing the mail. We look at the leading packages, including Neuron Data's \$5,000 brain buster, Nexpert Object. **136**

Tying the Net

BY BRENDA McLAUGHLIN AND STEPHAN SOMOGYI

A PC standard for corporate connectivity has finally added the Mac to its network. Our new NetWorkShop tested NetWare for Macintosh to see how this newcomer stacks up against AppleShare. Switching over can save you lots of money — or give you lots of headaches. **165**

StartUp

News

EDITED BY RUSSELL ITO

What do you do when you need to check a PostScript file while you're knee-deep in a text-only word processor? Where can you find an application that writes its own documentation? When hypermedia went off to the Ivy League, what new tricks did it learn? Answers to all these questions — plus news, rumors, the hottest new products, upgrades of old favorites, and more — in this brand-new StartUp section. **48**

Reviews

- Microsoft Excel 2.2 lets you teach an old workhorse new tricks. **60**
- Omnis 5 is a new database that's at home on the Mac or the PC. **61**
- TableTools simplifies complex tables in DTP'd documents. **62**
- Business Sense may be all the accounting software you need. ... **67**
- SmartForm Designer is Claris' entry in the electronic-forms arena. **68**
- XTree Mac challenges the Finder for the job of hard-disk manager. **78**
- MultiClip lets you have as many Clipboards as you want. **82**
- Voyager defines a new genre: desktop astronomy. **89**

Departments

Mail Merge

FROM THE MAC COMMUNITY

Readers identify Canvas 2.0's real competition, seek overseas Wingz, and address our dear Mr. Sculley. **8**

DTP

EDITED BY AILEEN ABERNATHY AND SALVATORE PARASCANDOLO

Fine Print

BY SALVATORE PARASCANDOLO
Can Apple's new outline-font technology or Adobe's ATM solve your screen-font woes? How long will you have to wait? We outline some current and future solutions. **239**

Desktop Tip: Illustrator

BY TOM WERNSMAN AND SALVATORE PARASCANDOLO
Lost an Illustrator 88 file? If you've already placed it in a PageMaker document, you can get it back and make your picture perfect once again. **243**

Desktop Tutorial:

Word 4.0 and PostScript

BY GREGORY WASSON

Word 4.0's powerful new PostScript variables, group commands, and glossary make it easy to write your own programs for fancy DTP effects. **245**

Bridges

EDITED BY HENRY BORTMAN

Currents

BY HENRY BORTMAN
Overhead LANs, desktop DOS, and more. **251**

A Guide to LocalTalk Routers

BY KEE NETHERY
The key to choosing a LocalTalk-to-LocalTalk router is reliability. Our NetWorkShop tested the five LocalTalk routers on the market. **257**

Trouble Shots

BY KURT VANDERSLUIS
Moving to an active-star network can solve "guerrilla" wiring problems. Keeping an active star running, though, takes special skills. **271**

Bobker's Dozen

BY STEVEN BOBKER
Quick looks at 13 no-nonsense products. Some of this month's stars: PictureBook, Pyro!, and ExpressWrite. **300**

About MacUser **6**

Coming Soon **294**

Advertiser Index **296**

Marketplace **280**

Power Tools

Losing Your Finder

BY JAMES FINN

Every Mac comes with the Finder, but that doesn't mean you're stuck with it. We take a tour of different ways to run your desktop: PowerStation, On Cue, DiskTools Plus, and DiskTop offer powerful features that enhance the Mac's fast, intuitive interface. **212**

Getting Involved with Your System

BY MICHAEL SWAINE

Here's a new column that shows you how to master your Mac with System techniques and sneaks that only the experts knew — until now. And if you think you're one of those experts, take the Swaine challenge: Can you solve his monthly puzzle? **217**

Keyboard Diagnostics

BY KRISTI COALE

A keyboard takes a lot of abuse, and it can pay you back by breaking just when you need it most. But that doesn't mean you have to spend a lot of money to replace it or get it fixed. We show you how to find the problem and fix it yourself, step by step. **222**



Tip Sheet

EDITED BY GREGORY WASSON

Readers send in tips, tricks, and undocumented features for FullWrite Professional, Smart Art, MacWrite II, and Ready, Set, Go! 4.5. **225**

Help Folder

BY CHRIS ESPINOSA

Shop for modems, print on a IISC, export text from Filevision, and reset using the programmer's switch. **231**

MacUser Labs

PostScript Printers



Fit to Print

BY HENRY BORTMAN, AILEEN ABERNATHY,
AND THE MACUSER LABS STAFF

Can any PostScript printer beat Apple's NTX? MacUser Labs tested them all — 16 models, from LaCie's \$3,499 PostScript clone to Varityper's \$17,000 high-resolution alternative — to find the fastest machine, cleanest output, and best overall bargain. Plus: How to save thousands of dollars by using your printer smarter. **178**

Columns

Paul Somerson • Editor's Desktop
Meet the new *MacUser*, all DTP'd up and everywhere to go. **27**

Robert Wiggins • Pinstripe Mac
The latest spreadsheets raise the ante — and the consumer wins. **33**

Jim Seymour • Mainstream Mac
Choosing Mr. Write: Is it WriteNow 2.0 or Word 4.0? **37**

Louise Kohl • Control Panel
As Guy Kawasaki's new tell-all book proves, he's a real wise Guy. **43**

John C. Dvorak • Devil's Advocate
A history of the computer industry, told with 20/20 hindsight. **306**

MacUser

Publisher Martin Mazner
Associate Publisher Jeffrey Miller

ZIFF-DAVIS PUBLISHING COMPANY

President William Lohse
Group Vice Presidents
William Lohse, J. Scott Briggs
Executive Vice President Steven C. Kahler
Senior Vice President, Marketing
Paul H. Chook
Vice President, Operations Baird Davis
Vice President, Production Roger Herrmann
Vice President, Controller John Vlachos
Vice President, Creative Services
Herbert Stern
Vice President, Research Marian O. White
Vice President, Classified Advertising
Alicia Marie Ivans
Vice President, Circulation Bert Lacy
Vice President, Circulation Services
James Ramaley
Subscription Director Paul Stafford
Single-Copy Sales Director
Robert Woltersdorf
Vice President, Marketing Services
Ann Pollak Adelman
Vice President, Development Seth R. Alpert
Director of Planning Gary A. Gustafson
Production Director Walter J. Terlecki

ZIFF COMMUNICATIONS COMPANY

Chairman William B. Ziff, Jr.
Vice Chairman Philip B. Korsant
President Kenneth H. Koppel
Senior Vice President Philip Sine
Senior Vice President Hugh Tietjen
Vice Presidents William Phillips,
J. Malcolm Morris, Steven C. Feinman,
Tom Thompson
Director of Development Jonathan Cohler
Treasurer Tom Thompson
Secretary Bertram A. Abrams

If you want to subscribe to *MacUser*, if you have a question or complaint about your subscription, or if you're moving, call or write *MacUser*, P.O. Box 56986, Boulder, CO 80321-6986; (800) 525-0643. New subscriptions and address changes take six to eight weeks. For back issues (subject to availability), send \$7 per issue, \$8 outside U.S., to Ziff-Davis Publishing Co., P.O. Box 5999, Cherry Hill, NJ 08034; Attn: F. Hunter, (609) 354-4975.

MacUser (ISSN 0884-0997) is published monthly by Ziff-Davis Publishing Co., a division of Ziff Communications Co., One Park Ave., New York, NY 10016. Editorial Office: 950 Tower Lane, 18th Floor, Foster City, CA 94404. Telephone: (415) 378-5600. U.S. subscription rates are \$27 for 12 issues, \$45 for 24 issues, and \$62 for 36 issues. Additional postage for Canada: add \$18 per year to the U.S. rates for surface mail. Single-copy price is \$2.95 (Canada \$3.95).

POSTMASTER: Send address changes to *MacUser*, P.O. Box 56986, Boulder, CO 80321-6986. Second-class postage paid at New York, NY 10016 and at additional mailing offices.

Entire contents copyright © 1989 Ziff-Davis Publishing Co., a division of Ziff Communications Co. All rights reserved; reproduction in whole or in part without permission is prohibited.

MacUser is a registered trademark of Ziff Communications Co. The following are trademarks of Ziff Communications Co.: Mainstream Mac, Pinstripe Mac, Quick Clicks, MacUser Labs, Open Window, Devil's Advocate, The Help Folder, Control Panel, NetWorkShop, Bridges, Scrapbook, Macintosh Analyst, MiniFinders.

EDITORIAL

Editor-in-Chief Paul Somerson
Executive Editor Louise Kohl
Managing Editor Nancy Groth
Senior Editor/Technology Andrew Abernathy
Senior Editor/Departments Jon Zilber
Features Editor Michael Miley
Senior Technical Writer James Finn
Senior Staff Writer Salvatore Parascandolo
Technical Editor John Rizzo
Assistant Managing Editor Claire Hamilton
Chief Copy Editor Eva Langfeldt
New Products Editor Gil Davis
Associate Editor James S. Bradbury
Associate Editor/Reviews Russell Ito
Associate Editor/Labs Owen W. Linzmayer
Senior Copy Editor Rhoda Simmons
Copy Editors Shari Lynn Allison, Mary Schuyler
Assistant Editors Kristi Coale, Laura Johnson
Editorial Administrator Shirley French
Editorial Assistant Michele Stokol
Reader Support Victoria Juarez
Contributing Editors
Chris Espinosa, Paul D. Lehrman, Carlos Domingo Martinez,
Dave Peltz, Daniel Rosenbaum, Jim Seymour,
Michael Swaine, Gregory Wasson
Contributing Business Editor Robert R. Wiggins
Contributing Anti-Editor John C. Dvorak
Assistant to the Editor-in-Chief Rosemary Neece

TECHNOLOGY

Executive Editor/Technology Jeffrey S. Young
MacUser Labs Director Andrew Eisner
NetWorkShop Director Henry Bortman
Senior Editor/Electronic Publishing John Anderson
Associate Project Leaders Kevin Countryman, Jeffrey S. Pittelkau
NetWorkShop Coordinator Stephan Somogyi
Labs Administrator Michael Sanchez
Network Administrator Romel Solis
Coordinator/Electronic Publishing Juliana Carlsen

DESIGN & PRODUCTION

Art Director Lisa Orsini
Associate Art Director Diane Dempsey
Art Assistant Peter A. Gould
Technical Art Director Michael Yapp
Technical Art Assistant Mark W. Sweeney
Junior Designer Jeffrey Felmus
Production Director Carlos Lugo
Production Manager Brenda Falco
Composition Supervisor Renée Johnson

CIRCULATION SERVICES

Circulation Managers Charles Mast, Melinda Kendall
Customer Service Kimberly Armstrong

ADVERTISING

Eastern Advertising Director Suzanne M. Zellner (617) 497-2638
Western Advertising Director Jeannine Barnard (415) 378-5674
National Account Manager Kathleen F. Lyman (415) 378-5612
National Telemarketing Manager Chris M. Tice (415) 378-5692
Mid-California District Sales Manager Keith Newman (415) 378-5628
Mid-California District Sales Representative Ellyn Kozlowski (415) 378-5664
Mid-California Telemarketing Manager Jeanie Buechner (415) 378-5658
Northwest District Manager Leslie Hutchison (415) 378-5605
Northwest District Manager Susan Williams (415) 378-5699
Northwest Telemarketing Manager Marti Gallagher (415) 378-5659
Southwest Senior District Sales Manager Roy J. Kops (213) 387-2100
Southwest District Sales Manager Catherine Davenport (213) 387-2100
Southwest District Sales Representative Carolyn A. Mueller (213) 387-2100
Northeast District Manager Gina Ciampa (617) 497-2636
Northeast District Sales Representative Michele Lipstein (617) 497-2635
Northeast Telemarketing Manager Amanda Waterfield (415) 378-5657
Southeast/Mid-Atlantic District Manager William Corsini (212) 503-5416
Southeast/Mid-Atlantic Sales Representative Angelo M. Turco, Jr. (415) 378-5658
Midwest District Sales Representative Charles Hofer (312) 346-2600
Midwest Telemarketing Manager Ariane Casey (415) 378-5622
National Advertising Coordinator Kim Risks (415) 378-5606
Classified Advertising Director Kathryn Cumberlander (212) 503-5115
Group Director of Marketing William R. Delaney (415) 378-5640
Marketing Manager Karen Davis (415) 378-5624
Marketing Services Coordinator Dori Harshman (415) 378-5604
Assistant to the Publisher Donna Candelori (415) 378-5602
Business Manager Rosemarie Carbone

Founding Publisher Felix Dennis

HOW TO REACH US

PRODUCT ANNOUNCEMENTS AND UPDATES

MacUser is always looking for new and unusual products for our New on the Menu, News Line!, Quick Clicks, and Scrapbook sections, as well as for feature coverage. If you've got a product that you'd like to tell us about — whether it's new or an upgrade — send your letters and/or press releases to Michele Stokol, Editorial Assistant, *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

TECHNICAL DIFFICULTIES AND HELP

Although we can't offer any telephone assistance, *MacUser* welcomes your technical questions. If you've got a Mac question or problem, send it to Chris Espinosa, The Help Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Chris works for Apple, and if he can't give you an answer himself, he'll find someone who can. Because of the volume of mail we receive, we can't answer all of your questions, so we also recommend that you take advantage of your local user groups. You can find the one nearest you by calling Apple toll-free at (800) 538-9696, ext. 500.

TIPS, HINTS, AND PROGRAMS

We love to get tips and hints (on a disk, please) from our readers. Any tips should be sent to Tip Sheet, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. We can't print every tip, but we try our best to pick the most interesting and representative ones for publication. We'd also like to hear from any programmers who are interested in contributing to our utilities disk series or labs benchmark disk series. If interested, contact Michele Stokol at the same address.

WRITING FOR MACUSER

If you have an idea for an article you'd like to write, we'd like to read it. Send a query letter with samples of your writing (published if possible) and some information about your background to Louise Kohl, Executive Editor, *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. No calls please. Since we rarely buy unsolicited manuscripts, save yourself some work and don't send us a completed article without writing first. Please allow four to six weeks for a reply.

PERMISSIONS AND REPRINTS

Material in this publication may not be reproduced in any form without permission. Please send permission requests to Chantal Laveland, Licensing Director, and reprint requests to Jennifer Locke, Ziff-Davis Publishing Co., a division of Ziff Communications Co., One Park Ave., New York, NY 10016.

COMPLAINTS ABOUT ADVERTISERS

MacUser's editors are not responsible for the content of the advertisements in the magazine, although our publisher makes every effort to prevent fraudulent and misleading advertising from appearing in the magazine. However, if you bought a product advertised in *MacUser*, are dissatisfied, and can't resolve the problem, write (do not call) Elizabeth McGinnis, Advertising Department, *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Include copies of relevant correspondence and please be as specific as possible.

MacUser is an independent journal, not affiliated in any way with Apple Computer, Inc.



Printed in the USA.

CANVAS™ 2.0 BEATS MACDRAW™ II

MACDRAW II
LIST PRICE \$395.00



MACUSER MAGAZINE NOVEMBER, 1988

Key Features:*

- All the standard drawing tools
- Unlimited layers
- Ultra-fine hairlines
- Editable arrowheads
- Smooth polygons
- Object libraries
- ± 32x magnification/reduction
- Text rotation
- High precision
- 8 available colors
- Auto-dimensioning of lines

CANVAS 2.0
LIST PRICE \$299.95



MACUSER MAGAZINE APRIL, 1989

Key Features:*

- All the standard drawing tools
- Unlimited layers
- Ultra-fine hairlines
- Editable arrowheads
- Smooth polygons
- Object libraries
- ± 32x magnification/reduction
- Text rotation
- Much higher precision
- 16.7 million available colors
- Auto-dimensioning of lines & arcs
- Join & split smooth curves
- PostScript® gray scales in 1° increments
- Continuous Bezier Curves
- Area & perimeter calculations
- Powerful Auto-Duplication options
- Central Object Control dialog
- Skew, perspective & distort effects
- Tear-away rulers
- Magnetic guide lines
- Complete set of bitmap editing tools
- Import & export of TIFF files
- Auto-tracing of imported bitmap images
- 72-2540 DPI, bitmap resolution
- PixelPaint™ compatible color palettes
- Editable, micro-adjustable airbrushes
- Full-feature DA version included.

5 MICE. NO WAITING.

MacDraw owners: Trade up to Canvas 2.0 for just \$99. Simply send your MacDraw Master Disk to Deneba at the address shown below, along with check or credit card info (card #, issuer, expiration date & signature).

We'll send you Canvas 2.0. The new big cheese in drawing programs.

If you want to see the Canvas difference for yourself, send us \$995 to receive a fully-featured Demonstration Copy.

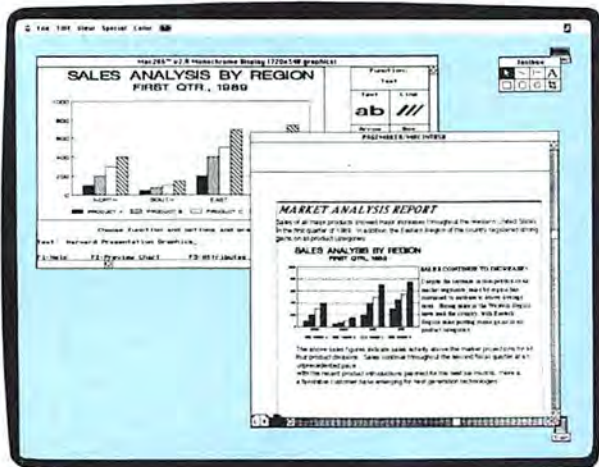
Deneba
SOFTWARE

3305 Northwest 74th Avenue Miami, Florida 33122
1-800-6CANVAS In Florida: (305) 594-6965
© 1989 Deneba Systems, Inc.
All product names mentioned are trademarks of their respective holders.

*Partial list

Please circle 80 on reader service card.

HIGH PERFORMANCE MS-DOS® for MACINTOSH™ with Mac286/86 2.0



PERFORMANCE THROUGH HARDWARE

The Orange Micro® Mac286™ brings the power of an IBM® AT™ to your Macintosh II™. Multiprocessing of MS-DOS and Macintosh applications at the same time is now possible. Get the true speed of an IBM AT with the Mac286, the highest performance MS-DOS compatibility solution available for your Mac II. Containing its own memory and powerful 80286 processor, the Mac286 benchmarks at 8.2 on the Norton Computing Index. That's *six times faster* than any software based solution.

If you own a Mac SE, the Mac86™ is your most powerful MS-DOS solution. Upgrade your SE with the Mac86 to get the optimum performance of an IBM XT™ and Macintosh in one system.

PERFORMANCE THROUGH APPLICATION COMPATIBILITY

The Mac286 and Mac86 open up new windows of opportunity by insuring compatibility with all major MS-DOS application packages. In fact, you can use MS-Windows™, AutoCad™, Lotus 123™, Lotus Symphony™ or Flight Simulator™ while simultaneously executing your favorite Mac program. Fortran, Pascal, and C language compilers can be run in the Mac286 or Mac86 windows. You can now turn your Macintosh II into a full development system.

PERFORMANCE THRU FILE SHARING

Transport files from your Mac286 or Mac86 window through the TOPS network to another Macintosh. Copy and Paste graphics from an MS-DOS charting program directly into Microsoft Word™, PageMaker™ or MacWrite™ on your Macintosh. Transport files easily back and forth between Macintosh and MS-DOS formats by using the Mac286 file utilities. With two quick steps, files as complex as AutoCad designs or as simple as text files can be transferred back and forth between the Mac286/86 and the Macintosh.



1400 N. Lakeview Ave., Anaheim, CA 92807
(800) 223-8029, In CA (714) 779-2772

IBM, AT and XT; Macintosh, Macintosh II and Macintosh SE; MS-Windows, MS-DOS, Flight Simulator and Microsoft Word, PageMaker, AutoCad, MacWrite, Mac286 and Mac86; Norton Computing Index; Lotus 123 and Lotus Symphony; TOPS are registered trademarks of IBM Corporation, Apple Computer, Inc., Microsoft Corporation, Aldus Corporation, AutoDesk Corporation, Claris Corporation, Orange Micro, Inc., Norton Utilities & Software Company, Lotus Development Corporation, and Sun Microsystems, Inc., respectively.

© Orange Micro, Inc. 1989

Please circle 16 on reader service card.

About MacUser...

DTP: The Inside Story

As regular *MacUser* readers know, we've been steadily incorporating desktop-publishing technology into our production process. Over the past few months, we've been applying the lessons presented in our DTP section. This issue is a milestone, however, because we produced it entirely with DTP tools. No wires, no mirrors, no artificial ingredients.

How is it done? In a nutshell, after editors turn in their stories, the articles are placed on PageMaker pages. Using Adobe Illustrator 88, designers next add all the graphic elements — such as logos, icons, spot color, and informational graphics — to the pages and then print them directly



PHOTOGRAPHY: PETER ALAN GOULD

to film as four-color separations, using a Linotronic 300 imagesetter.

The process demands painstaking coordination among the copy-editing, design, and production departments, as well as with the many writers and editors. The payoffs are substantial: reduced cost and greater control over both the art and editorial content. And the more control we have over the production process, the easier it is for us to bring you the latest and most accurate information.

MacUser's evolution toward DTP started last December with our first desktop-published Lab Report, "The Data Chase." Since then, we've extended the charter for that first report to include the rest of *MacUser*: Deliver extremely useful information in an extremely readable and attractive format.

To meet that goal, Art Director Lisa Orsini and Technical Art Director Michael Yapp created new design elements for our DTP transition that would be simple and bold but still reflect the technical orientation of our readers. They call it a neoclassical Bauhaus design (in which form follows function), reflected in bold type, sans serif headlines, a little more white space, and a primary color palette. We call it easier to read — and far more effective in delivering the key information you need.

Our inspiration continues to be the intuitive and easy-to-access architecture of the Mac itself. But the Mac has come a long way since we started writing about it, and we're determined to keep pace. Don't be shy about sharing your opinion of the new *MacUser* look and feel with us.



...makes sense. Well done.
Exactly. So when do we start?"

How people who get what they want,
get what they want.



It takes quite a booklet to show you all the terrific ways Apple Desktop MediaSM can help you express your ideas.

If you've ever worked with an Apple® Macintosh® computer, or watched someone working on a Macintosh, you know that it had to happen.

The ability to command a whole world of communicating without leaving your chair.

To create what you need to get your ideas across with maximum impact. Not just in one medium, but in all media.

That's Apple Desktop Media.SM

And to show you what it's all about, we'd like to place something else on your desk.

An especially beautiful and informative booklet.

You can get a copy just by mailing in the coupon on the right.

But here's a little sampling of what it's about.

For the printed page, you probably already know how a Macintosh can help you produce better-looking memos and reports. And do them faster than ever before.

Now imagine incorporating the visual impact of high-quality graphics.

Even photographs. And retouching or modifying them right on screen. Even adding special effects. And still printing right from your desktop. In color or black-and-white.

Now imagine doing all of that for 35mm slides or overheads. With the final product just the way you want it.

Now imagine doing all of that in live media. Creating your own interactive demonstrations with HyperCard.[®] Where individuals can choose just what they want to know more about.

Or having your message seen and heard with real animation. With characters that can walk or talk. Along with a full soundtrack.

But why go on?

Our fascinating booklet awaits you.

Send in the coupon or call our toll-free telephone number.



And see just how much impact you can generate without even leaving your chair.



The power to be your best.TM

Mail this coupon or call
toll-free 1-800-732-3131, Ext. 200.

And all it takes to get the booklet is this.

Mail to: Apple Desktop MediaSM Booklet
Apple Computer, Inc.
P.O. Box 751630
Memphis, TN 38175-9967

Please send me your booklet telling all about Apple Desktop Media.SM Of course, the booklet is free.

Name

Address

City

State

Zip

Phone

Offer expires October 31, 1989.

MU3



MAIL

M E R G E

Power to the People: Greg Henderson of Leamington, Ontario, writes: "I love MacUser, but could we get an occasional article on how other users are power-using their Macs? We need some creative ideas." Well, Greg, just for you — and 300,000 of your closest friends — we're launching a new section this month called Power Tools, filled with creative tips and techniques for getting the most out of your hardware and software.

WRITE TO

**Letters to the Editor, c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404**

All letters become the property of MacUser, and we reserve the right to edit any letters we print.

■■■■■■■■■■
COMPILED BY JON ZILBER

In Search of Smart Software

What do Mac users want? I'm glad Paul Somerson asked (July '89).

I want a word processor that, when I open it, *asks* me what I want. For example: a book divided into chapters, text that I can lay out according to given specs, universal find/replace/index searches that run through the whole book (whether the files are open or closed), a style sheet that learns as the book develops and that ensures that *ground water* doesn't appear as *groundwater*—in short, I want an interactive program that will help me customize the functionality for this particular job.

We're still in the Dark Ages as far as the interaction of software and user goes. There's a fortune waiting for the programmers who understand the problems and can solve them.

**Karen Arms
Savannah, GA**

It's time to reread Ted Nelson's Computer Lib (first published in 1974). It's still all true. — JF

I've Got a Little List

You did a great job of reviewing Canvas 2.0 (April '89), and the comparison with MacDraw II was insightful — but I don't think you compared Canvas to its real competition. The head-to-head comparison was partly motivated by the fact that the list prices for the two programs are in the same ballpark (\$299 for Canvas, \$395 for MacDraw II). But consumers are more interested in actual street prices, not manufacturers' suggested list prices. One typical discounter prices Canvas at \$159 and MacDraw at \$309. Better comparisons could have been made with Drawing Table (with a street price of \$76), Cricket Draw (\$168), and SuperPaint (\$129). On this basis, MacDraw competes with the likes of FreeHand 2.0 (\$349) and Illustrator 88 (\$299). And against that competition, MacDraw II strikes out.

**Michael G. Rudel
Houston**

The Overseas Connection

There has been much debate in Australia about the high price of software. There are substantial savings in buying from

U.S. mail-order houses, even with the steep shipping charges. However, after placing an order with MacConnection, I was shocked to find — three weeks later — that my order had been canceled because it totaled less than \$250. (In addition, a 2-percent surcharge would have been incurred.) What sort of service is this? Sure, MacConnection is within its rights to implement such policies, but it won't endear itself to potential overseas clients.

**Phillip R. Thompson
Canberra, Australia**

I planned to buy a new Apple computer, and I asked the mail-order company MacConnection for a price quotation for Wingz. To my surprise, it replied that it was not allowed to ship the program overseas. I do not understand this. To my knowledge Belgium is not a communist country that would be subject to COCOM restrictions.

This is a strange kind of protectionism, refusing to sell goods abroad. Now I can understand the reason behind the big American trade imbalance.

**Louis Engelen
Embassy of Belgium
Tokyo**

First the good news: MacConnection will sell Wingz to citizens of Belgium (or any other regular U.S. trading partner). The bad news is that many mail-order firms don't really want foreign business, since it's next to impossible to get local support for these products. Another option is to buy the International-English version of Wingz through Informix's Japanese distributor, Ascii, which is working on the upcoming Kanji Wingz. It will cost ¥28,000 (about \$880 — or the price of a good dinner in Tokyo). — JB

ResEdit Revisited

A few concerns about the ResEdit article by Darryl Lewis (June '89): The statement that "the data fork is the programmer's code that makes an application do what it is supposed to do" is wrong. The data that does this is in the CODE resource. The data fork is simply data that the application can use any way it sees fit. The statement that "the resource fork controls what you actually



House.



Senate.

We found a measure they could both agree on.

Up on the hill it looked like another split along party lines. Both Macintosh and PC users fought for access to the same information. Until a TOPS network brought them together in bipartisan agreement, that is.

TOPS Tech Specs

- TOPS supports AppleTalk and FlashTalk running on twisted-pair cabling (telephone wire), and EtherTalk on thick or thin Ethernet cabling.
- All IBM PCs, PS/2 Models 25 or 30, or compatibles require TOPS FlashCard, 3Com EtherLink II or Western Digital EtherCard Plus. PS/2 Models 50 through 80, or compatibles require 3Com EtherLink/MC card.
- TOPS can be configured as a distributed, dedicated, or combination server network.

Maybe that's why TOPS has been voted the de facto standard for easy Mac-to-PC connectivity by some 600,000 users. All you have to do is install TOPS software in each Macintosh and PC on the network, add a network card to each PC, and you've got a quorum.

A polished diplomat in any arena, TOPS easily trades data from Lotus 1-2-3 to Excel, Microsoft Word PC to Word Mac and most other Mac and PC applications.

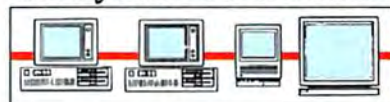
And if you're looking to discuss the issues with other networks and systems, such as Novell, AppleShare, and Sun NFS, TOPS provides the perfect forum.

No wonder, when it comes to making connections, TOPS is the people's choice. Call the TOPS Division of Sun Microsystems at 1-800-445-TOPS, ext. 306.



TOPS®

When you need connections.



From outside the U.S. and Canada, call TOPS at 1-415-769-8700, ext. 306. Or write to TOPS, 950 Marina Village Parkway, Alameda, CA 94501. For information on European distribution, call 44 276 51440.

Seek and you shall find

See the red stars? They highlight companies participating in our 30 or 60 day money-back guarantee program. Which means you can return any product from these companies within 30 (or 60) days of receiving it, if, by any chance, it just doesn't do what you need it to do. All we ask is that you save the original packaging. Because, in order to refund your money we need the whole kit and kaboodle back—right down to the registration card. (Just make sure that, during the warranty period, the dog doesn't run off with the packaging materials or the kids don't start using the disks for frisbees).

We only carry the latest versions of products. Version numbers in our ads are current at press time. Also, all of the software we sell is not copy-protected, unless indicated otherwise by (CP).

The four-digit number next to each product is the product's ITEM NUMBER. Please refer to this number when ordering. Thank you.

ACCOUNTING & FINANCE

★Aatrix Software ... 30 day MBG

3976	Aatrix Payroll 3.5	\$95.
4021	Aatrix TimeCard 2.0	105.
4020	Aatrix TimeMinder 2.1.2	155.
3958	Aatrix Payroll PLUS 3.1	155.

Bedford Software

4977	Simply Accounting 1.04	199.
------	------------------------	------



Silicon Beach Software ... 60 day MBG

SuperCard 1.0—A toolkit for creating multimedia projects, from simple stacks to stand-alone applications. Features color paint and draw tools, animation, on-line scripting reference, and custom windows and menus. \$129.

★Chang Labs ... 60 day MBG

1613	Rags to Riches Ledger 3.1	119.
1614	Rags to Riches Payables 3.1	119.
1617	Rags to Riches Receivables 3.1	119.
1622	Rags to Riches 3-Pak	see box
1612	Inventory Control 2.6	see box
1615	Professional Billing 2.9	see box
1616	Professional 3-Pak	359.
1618	Retail Business 3-Pak	359.

★DacEasy Software ... 60 day MBG

4502	DacEasy Light 1.0	42.
------	-------------------	-----

★Dow Jones ... 30 day MBG

1786	Market Manager PLUS 2.0	189.
------	-------------------------	------



Software Ventures ... 30 day MBG

MicroPhone II 3.0—The newest version of the top telecom software adds ZMODEM, on-screen icons, color and sound, as well as support for XCMDs and XFCNs. \$219.

★Intuit ... 30 day MBG

2425	Quicken 1.5	32.
------	-------------	-----

★Layered ... 30 day MBG

5207	atOnce! 1.0	295.
------	-------------	------

★MECA ... 60 day MBG

2796	Managing Your Money 2.0	125.
------	-------------------------	------

★Monogram ... 30 day MBG

2780	Dollars & Sense 4.1C	81.
------	----------------------	-----

2779	Business Sense 1.2	269.
------	--------------------	------

★Nantucket ... 30 day MBG

2971	McMax 2.0	175.
------	-----------	------

★Niles & Associates ... 30 day MBG

5101	Grant Manager 1.75	249.
------	--------------------	------

★Nolo Press ... 60 day MBG

2981	WillMaker 3.0	32.
------	---------------	-----

★North Edge Software ... 30 day MBG

2986	Timeslips III 1.1	169.
------	-------------------	------

Pro Plus Software

4310	Wall Street Investor 3.0	469.
------	--------------------------	------

Satori

3978	Components GL 1.0	389.
------	-------------------	------

3324	Project Billing 1.56	389.
------	----------------------	------

4987	Project Billing + 1.56	589.
------	------------------------	------

3323	Legal Billing II 2.56	389.
------	-----------------------	------

4986	Legal Billing II + 2.56	589.
------	-------------------------	------

SoftView

3471	MacInUse 2.04	42.
------	---------------	-----

3981	FormSet 1.1	52.
------	-------------	-----

★Survivor Software ... 30 day MBG

3289	MacMoney 3.02	60.
------	---------------	-----

NUMBERS & DATABASES

★Abacus Concepts ... 60 day MBG

4482	StatView SE + Graphics 1.03	225.
------	-----------------------------	------

4481	StatView II 1.03	295.
------	------------------	------

★Access Technology ... 60 day MBG

1346	Trapeze 2.1	149.
------	-------------	------

★Acius ... 30 day MBG

1010	4th Dimension 1.0.6	349.
------	---------------------	------

4024	4th Dimension Runtime 1.06	229.
------	----------------------------	------

Ashton-Tate

4098	Full Impact 1.0	249.
------	-----------------	------

1322	dBase Mac	295.
------	-----------	------

Blyth Software

4318	Omni 3 Plus/Express 3.3	199.
------	-------------------------	------

Borland International

1508	Reflex Plus 1.01	189.
------	------------------	------

★BrainPower ... 60 day MBG

1532	DataScan 1.03	\$109.
------	---------------	--------

1535	DesignScope 1.15	119.
------	------------------	------

1534	MathView Professional 1.1	129.
------	---------------------------	------

1537	StatView 512+ 1.2	149.
------	-------------------	------

3960	ArchiText 1.03	175.
------	----------------	------

4066	The Analyzer Bundle (includes DataScan, DesignScope, and StatView 512+)	299.
------	---	------

★Bravo Technologies ... 30 day MBG

1539	MacCalc 1.2D	83.
------	--------------	-----

★Chang Labs ... 60 day MBG

1611	C.A.T. 2.0	229.
------	------------	------

Claris

4196	FileMaker II 1.0	229.
------	------------------	------

1125	MacProject II 2.0	379.
------	-------------------	------

★Fox Software ... 30 day MBG

4580	FoxBASE + /Mac Runtime 2.0	155.
------	----------------------------	------

4195	FoxBASE + /Mac 2.0	255.
------	--------------------	------

4844	FoxBASE + /Multi-User 2.0	355.
------	---------------------------	------

ICOM Simulations

5206	Formulator 1.1	89.
------	----------------	-----

Individual Software

4720	101 Macros for Excel 1.5	35.
------	--------------------------	-----

Informix

4955	Wingz 1.0	259.
------	-----------	------

★Microsoft ... 30 day MBG

2866	File 2.0A	125.
------	-----------	------

2884	Works 2.0	185.
------	-----------	------

2865	Excel 2.2	249.
------	-----------	------

5454	The Microsoft Office (includes Excel, Word, PowerPoint, and Mail)	499.
------	---	------

★Nolo Press ... 60 day MBG

4228	For the Record 1.01	29.
------	---------------------	-----

★Odesta ... 30 day MBG

3014	GeoQuery 1.0	199.
------	--------------	------

4211	DataDesk Professional 2.0	289.
------	---------------------------	------

3013	Double Helix II 2.0R51	339.
------	------------------------	------

★Paracomp ... 30 day MBG

4664	Milo 1.0	159.
------	----------	------

★Preferred Publishers ... 30 day MBG

4780	DAtabase 1.12	72.
------	---------------	-----

★ProVUE ... 60 day MBG

4582	Panorama 1.1.1	205.
------	----------------	------

★Rubicon Publishing ... 60 day MBG

3272	Dinner At Eight-Encore Edition (CP)	45.
------	-------------------------------------	-----

Satori

3320	BulkMailer 3.23	78.
------	-----------------	-----


3321	BulkMailer Plus 3.23	189.
------	----------------------	------



Preferred Publishers ... 30 day MBG

DAtabase 1.12—Full-featured desk accessory database for text, graphics and color images. Includes a unique converter and minifinder interface for merging and accessing frequently used files. \$72.

all things for your Mac.



Nolo Press ... 60 day MBG
For the Record 1.01—Organize personal, financial, and legal records for quick reference \$29.
WillMaker 3.0—Here's the first step in estate planning. Prepare your own valid will without a lawyer. 32.

5070	World-Class LaserType Vol. 2	\$42.
5071	World-Class LaserType Vol. 3	42.
5072	World-Class LaserType Vol. 4	42.
5073	World-Class LaserType Vol. 5	42.
5074	World-Class LaserType Vol. 6	42.
3972	World-Class Fonts! Originals	42.
3973	World-Class Fonts! Stylish	42.
3974	World-Class Fonts! Giants	42.
5131	World-Class Fonts! Triples	42.
3964	WetPaint Classic Clip-Art (1 & 2) . . .	42.
3965	WetPaint For Publishing (3 & 4) . . .	42.
3966	WetPaint Animal Kingdom (5 & 6) . .	42.
3967	WetPaint Special Occasions (7 & 8) .	42.
3968	WetPaint Printer's Helper (9 & 10) . .	42.
3969	WetPaint Industrial Revol. (11 & 12) .	42.
3970	WetPaint Old Earth Almanac (13 & 14)	42.
3971	WetPaint Island Life (15 & 16)	42.
4940	WetPaint All the People (17 & 18) . .	42.

Electronic Arts		
5289	Studio/1 1.0	99.
4315	Studio/8 1.0	299.

★Emerald City ... 30 day MBG		
5168	Smart Art 1.0.1	85.

★Enabling Technologies ... 30 day MBG		
1871	Pro3D 1.2.	279.

5019	Clip 3D Accents	57.
5026	Clip 3D Business	57.
5020	Clip 3D Fonts	57.
5022	Clip 3D Geography.	57.
5027	Clip 3D Lifestyle	57.
5023	Clip 3D Messages	57.
5024	Clip 3D People	57.
5025	Clip 3D Recreation	57.

Enzan-Hoshigumi USA		
1879	MacCalligraphy 2.0	99.

★Foundation Publishing ... 60 day MBG		
2385	Comic People	22.

2384	Comic Strip Factory 1.6	39.
★Generic Software ... 60 day MBG		

4319	Generic CADD Level 1 1.1	85.
------	------------------------------------	-----




Broderbund Software
SimCity 1.1—Be the mayor, planner, and a citizen of your own community. Plan, develop, and watch your city grow. Raise taxes and embezzle funds. Includes eight scenarios or you can build your own. \$29.

★Graphsoft ... 30 day MBG		
4993	MiniCad+ 1.V5	\$519.

★Great Wave ... 30 day MBG		
2272	Crystal Paint 1.0.	special 25.

Innovative Data Design		
2417	MacDraft 1.2B	144.
4710	Residential Construction Library . .	139.
4707	Dreams 1.0.	269.



Dow Jones ... 30 day MBG
Market Manager PLUS 2.0—Keeps track of your investments and automatically values your portfolio with current security prices from Dow Jones News/Retrieval. Perfect for the beginner or seasoned investor. \$189.

★Linguist's Software ... 60 day MBG		
Foreign Language Fonts. call		

★MacroMind ... 30 day MBG		
4953	VideoWorks II 2.0	175.

4952	VideoWorks II HyperCard Driver 1.2	60.
4954	VideoWorks II Accel. 1.1	special 99.

5087	MacroMind Director 1.0	449.
★NuEquation ... 30 day MBG		

5428	NuPaint 1.0.4	89.
★Paracomp ... 30 day MBG		

4597	Swivel 3D 1.0	249.
★Silicon Beach ... 60 day MBG		

3504	Silicon Press 1.1	52.
3506	SuperPaint 2.0	128.

3980	Digital Darkroom 1.1	249.
3507	Super3D 2.0	319.

★Solutions Int'l. ... 60 day MBG		
3446	The Curator 1.05	72.

★SuperMac Software ... 60 day MBG		
3380	PixelPaint 2.0	229.

★Symmetry ... 30 day MBG		
4160	PictureBase-WetPaint	special 79.

★T/Maker ... 30 day MBG		
3632	Business Images	28.

3636	Holidays	28.
3642	Publications	28.

3633	Christian Images.	35.
★3G Graphics ... 30 day MBG		

3942	Images with Impact: Graphics 1 . . .	52.
4583	Images with Impact: Business 1 . . .	65.

★Zedcor ... 60 day MBG		
3986	DeskPaint & DeskDraw 2.01	65.

GRAPHICS & DESIGN		
★Aegis Development ... 60 day MBG		
4956	Showcase F/X 1.0.	199.
Altsys		
5425	Art Importer (formerly KeyMaster) . .	99.
1194	FONtastic Plus 2.02	51.
Ashton-Tate		
1323	FullPaint	67.
Bright Star Technology		
3962	HyperAnimator 1.5	99.
Broderbund Software		
4065	PosterMaker Plus 2.5B	35.
1427	Print Shop 1.3.	35.
4501	Drawing Table 1.0.	35.
★Casady & Greene ... 60 day MBG		
1575	Fluent Fonts 2.0	27.
★Challenger ... 30 day MBG		
1610	Mac3D 2.1.2.	119.
Claris		
1123	MacPaint II 2.0	99.
1117	MacDraw II 1.1	299.
4815	Smart Form Designer 1.0	299.
4814	Claris CAD 1.0	599.
Cricket Software		
4346	Cricket Paint 1.0.	special 65.
1667	Cricket Draw 1.1.1	special 139.
5086	Cricket ColorPaint 1.0	179.
★Deneba Software ... 30 day MBG		
1769	Canvas 2.0	169.
★DreamMaker ... 60 day MBG		
4088	MacGallery (MacPaint format)	27.
Dubl-Click Software		
5069	World-Class LaserType Vol. 1	42.

To manage your money



MECA ... 60 day MBG

Managing Your Money 2.0—Use it for taking care of budgets and bank accounts, calculate your net worth, and track investments. Why, it could even be tax deductible! \$125.

PUBLISHING & PRESENTATIONS

Adobe Systems

1138	The Collector's Edition	79.
4816	The Collector's Edition II	139.
5001	StreamLine 1.0	229.
1137	Adobe Illustrator '88 1.6	289.
1142	Newsletters/Publishing Pack 1	239.
4565	Forms and Schedules Pack 2	289.
4566	Presentations Pack 3	289.
4025	1 Palatino	125.
4026	2 ITC Bookman	125.
4027	3 ITC Zapf Chancery	95.
4028	4 ITC Avant Guard	125.
4029	5 New Century School	125.
4030	6 Optima	125.
4031	7 ITC Souvenir	125.
4032	8 ITC Lubalin Graph	125.
4092	9 ITC Garamond	125.
4033	10 ITC American Type	95.
4034	11 ITC Benguiat/Friz	125.
4035	12 Glypha	125.
4094	13 Helvetica Light Black	125.
4093	14 Helvetica Condensed	239.
4036	15 Trump Medieval	125.
4037	16 Melior	125.
4038	17 ITC Galliard	125.
4039	18 ITC New Baskerville	125.
4040	19 ITC Korinna	125.
4041	20 Goudy Old Style	125.
4042	21 Sonata	63.
4043	22 Century Old Style	95.
4044	23 ITC Franklin Gothic	179.
4045	24 ITC Cheltenham	125.
4046	25 Park Avenue	63.
4047	26 Bodoni	125.
4048	27 Letter Gothic	125.
4049	28 Prestige Elite	125.
4050	29 Orator	95.
4051	30 News Gothic	125.
4052	31 ITC Tiffany	179.
4053	32 Cooper Black	95.
4054	33 Stencil/Hobo/Brush	95.
4091	34 Aachen/Revue/Freestyle	125.
4055	35 Carta	63.
4197	36 Lucida	125.
4198	37 Univers	239.

4199	38 Univers Condensed	\$179.
4101	39 Futura 1	179.
4234	40 Stone Serif	179.
4102	41 Stone Sans Serif	179.
4200	42 Stone Informal	179.
4235	43 Corona	95.
4236	44 Eurostyle	179.
4216	45 Excelsior	95.
4217	46 Futura 2	179.
4218	47 Futura Condensed	239.
4219	48 Lucida Sans Serif	125.
4220	49 Memphis	239.
4221	50 Helvetica Compressed	95.
4222	51 Italia	95.
4223	52 Belwe	125.
4224	53 Caslon	125.
4225	54 Goudy	95.
4226	55 Janson Text	125.
4227	56 Eras	179.
4567	57 ITC Kabel	125.
4568	58 OCR A, OCR B, Micr	95.
4569	59 Helvetica 1	125.
4570	60 Helvetica 2	179.
4571	61 Helvetica 3	179.
4572	62 Times Ten	125.



Microsoft ... 30 day MBG

The Microsoft Office—A terrific value. Includes Word 4.0, PowerPoint 2.01, Excel 2.2, Mail 1.37, with bonuses like SuperPaint, AutoMac, WordFinder Thesaurus, and discount coupons for other applications. \$499.

4573	63 Kaufman	95.
4574	64 Clarendon	95.
4575	65 Peignot	95.
4576	66 New Caledonia	239.
4577	67 ITC Clearface	239.
4578	68 American	125.
4579	69 ITC Serif Gothic	179.
4817	70 Century Expanded	95.
4818	71 Serifa	179.
4819	72 Caslon Open Face	63.
4820	73 Frutiger	239.
4821	74 Centennial	239.
4822	75 Stemple Garamond	125.
4823	76 Weiss	125.
4824	77 Garamond 3	125.
4825	78 Univ News Comm/Greek	95.
4826	79 Avenir 1	179.
4827	80 Avenir 2	179.
4828	81 Walbaum	125.
4829	82 Antique Olive	125.
5210	83 Life	95.
5239	84 Concorde	125.
5240	85 Gothic 13	95.

5241	86 Cochin	\$125.
5242	87 ITC Bauhaus	125.
5243	88 Sabon	125.
5244	89 Hiroshige	239.
5245	90 Arnold Bocklin	125.
5246	91 Dom Casual	95.
5247	92 Post Antiqua	95.
5248	93 Folio	125.
5249	94 Linoscript	95.
5250	95 VAG Rounded	125.

Aldus

1330	Freehand 2.0	349.
4751	Persuasion 1.0	375.
1331	PageMaker 3.01	389.

Altsys

1195	Fontographer 3.0 (CP)	219.
------	-----------------------	------

Broderbund

4465	DTP Advisor 1.0	47.
------	-----------------	-----

★Casady & Greene ... 60 day MBG

4839	Vivid Impressions	67.
1576	1 Bodoni	46.
1587	2 Sans Serif	46.
1588	3 Ritz	46.
1589	4 Monterey	46.
1590	5 Calligraphy	46.
1591	6 Prelude	46.
1592	7 Coventry-Zephyr	46.
1593	8 Dorovar-Gregorian	46.
1594	9 Cyrillic	46.
1577	10 Bodoni Ultra	46.
1578	11 Sans Serif Bold	46.
1579	12 Sans Serif Extra Bold	46.
1580	13 Gatsby Light	46.
1581	14 Micro	46.
1582	15 Micro Extended	46.
1583	16 Galileo Roman	46.
1584	17 Campanile-Giotto	46.
1585	18 Alexandria	46.
1586	19 Jolt	46.
4204	20 Gazelle & Kells	46.
4205	21 Paladin-Abalene	46.
4206	22 Collegiate	46.
4838	Quill Pack (Vol. 8 & 20)	89.
4836	Headline Pack (Vol. 10-12)	129.
4837	Modern Pack (Vol. 7, 14-18)	189.
4834	Distinctive Pack (Vol. 8, 19-22)	189.
4833	Classic Pack (Vol. 3-6, & 13)	189.



Microlytics ... 60 day MBG

GOfer 2.0—A powerful software utility for searching, finding and retrieving text. A phrase, a fact, a note, or a date—if you need it now, GOfer will find it in a matter of seconds. \$47.

or design your day.

Cricket Software

- 1668 Cricket Graph 1.3 \$115.
1670 Cricket Presents 2.0 285.

★DreamMaker ... 60 day MBG

- 4840 Cliptures: Business 1 85.
4841 Cliptures: Business 2 85.

★Farallon Computing ... 30 day MBG

- 4684 ScreenRecorder 1.0 129.
2199 MacRecorder 2.0 164.

Letraset

- 2621 Ready, Set, Go! 4 4.5 275.
2619 Image Studio 1.5 275.
4709 LetraStudio 1.0 275.

★Microsoft ... 30 day MBG

- 2878 PowerPoint 2.01 249.

★Postcraft Int'l. ... 60 day MBG

- 3157 Laser FX 1.7 99.

Quark

- 4621 QuarkStyle 1.0 175.
3230 Quark XPress 2.1 495.

★Softstream Int'l., Inc. ... 60 day MBG

- 4996 UltraSpec 1.0 95.

★Springboard ... 30 day MBG

- 3530 Certificate Maker 2.0 22.
3532 Certificate Library 18.
4497 Top Honors 1.01 59.
4500 Springboard Publisher 1.0 109.

★T/Maker ... 30 day MBG

- 3635 EPS Illustrations 74.
5167 EPS Business Art 74.



CompuServe ... 60 day MBG

CompuServe Navigator 3.0—Speeds you through CompuServe sessions, reducing online time and costs. Automatic uploading and downloading makes file transfer easy. Can even run unattended or in the background with MultiFinder ... \$45.

PROGRAMMING & HYPERMEDIA

Apple Computer

- 1118 HyperCard 1.2.2 42.

Bantam Publishing

- 1403 Complete HyperCard Handbook ... 23.

★Beacon Technology ... 30 day MBG

- 4967 HyperBible (King James) 1.0 149.
4968 HyperBible (New International) 1.0 179.



Symantec ... 30 day MBG

THINK C 4.0—An object-oriented C compiler complete with class libraries for creating user interfaces. Incredible speed, source-level debugging and full ANSI-standard libraries. 1988/89 SPA, Eddy, and Byte award-winner. \$149.

Borland International

- 1511 Turbo Pascal 1.1 68.
1512 Turbo Pascal Tutor 1.0 46.

Broderbund Software

- 5237 Whole Earth Catalog (CD ROM) ... 89.

★Digitalk ... 60 day MBG

- 5166 SmallTalk/V Mac 1.0 129.

★DreamMaker ... 60 day MBG

- 4115 MacGallery (HyperCard format) ... 27.

★Hyperpress Publish. ... 30 day MBG

- 5435 HyperOne 1.0 29.
4233 Icon Factory 1.0 29.
5089 Script Library 1.0 29.
5090 Silver Screen 1.0 40.
4265 Script Expert 1.0 45.
5434 Intelligent Developer 1.0 225.

Individual Software

- 4719 101 Scripts & Buttons Hypercard 1.0 ... 36.

★Manx Software ... 60 day MBG

- 4068 Aztec C 3.6B 65.
4317 Aztec SDB 65.
4316 Aztec C UniTools 65.
4069 Aztec MPW C 3.6B 99.
4075 Aztec C + SDB 3.6B 99.

★Microsoft ... 30 day MBG

- 4471 QuickBasic 1.0 65.

Olduval

- 5446 PLUS 1.1 115.

★OWL International ... 30 day MBG

- 3082 Guide 2.0 99.

★Silicon Beach ... 60 day MBG

- 5100 SuperCard 1.0 129.

★SmethersBarnes ... 30 day MBG

- 1478 Prototyper 2.0 149.

★Softstream Int'l., Inc. ... 60 day MBG

- 5440 HyperHIT 1.0 125.

Springboard

- 4495 Family Matters 1.0 28.

★Symantec ... 30 day MBG

- 4644 Just Enough Pascal 1.0 47.

- 3421 THINK Pascal 2.0 \$89.
3420 THINK C 4.0 149.

★Symmetry ... 30 day MBG

- 3318 HyperDA 1.1 35.

TENpoint0

- 1338 Reports! 1.2 69.

- 4638 Focal Point II 1.0 117.

★TML Systems ... 30 day MBG

- 3548 TML Source Code Library II 1.1 ... 39.

- 4989 TML Pascal II 3.0 (w/o MPW 3.0) ... 57.

- 3549 TML Pascal II 3.0 (w/MPW 3.0) ... 109.

Trendware

- 5203 Stack Cleaner 29.

- 5202 HyperTools #1 1.02 52.

- 5199 HyperTools #2 1.03 52.

True BASIC, Inc.

- 3587 True BASIC 2.01 59.

- 3573 Arithmetic 35.

- 3571 Algebra Utilities 35.

- 3575 Calculus Utilities 35.

- 3580 Pre-Calculus (with Trigonometry) ... 35.

- 3583 Scientific Graphics Tool Kit 49.

★Zedcor ... 60 day MBG

- 3985 ZBASIS 5.0 95.

UTILITIES

★Abbott Systems ... 30 day MBG

- 5236 CanOpener 1.0 65.

★Affinity Microsystems ... 60 day MBG

- 1014 Affinifile 1.1 45.

- 1016 Tempo II 1.02 79.

★Berkeley Systems ... 30 day MBG

- 1541 Stepping Out II 2.01 50.

Beyond, Inc.

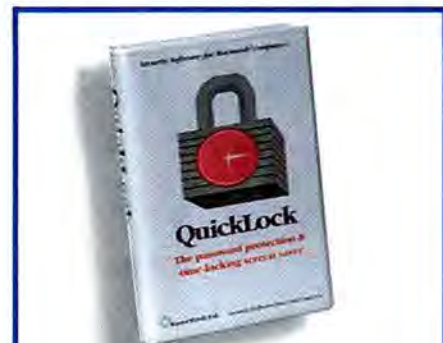
- 4203 MenuFonts 2.02 28.

Borland

- 1510 Sidekick 2.0 68.

★Bravo ... 30 day MBG

- 5404 SPAMM 49.



Kent Marsh ... 30 day MBG

QuickLock 1.0—At last! A password-protected screen saver that remains active even when rebooting. A simple prompt for the password keeps unwanted eyes off your work. \$57.

To predict the future



Symantec ... 30 day MBG

S.A.M. 1.0—Detects viruses by monitoring the suspicious activities that characterize them. Viruses can be immediately deleted, protecting your software from further infection ... \$63.

★Casady & Greene ... 60 day MBG

2269 QuickDEX 1.4A ... 31.

★CE Software ... 60 day MBG

1727 CalendarMaker 3.0 ... 32.
1728 DiskTop 3.0.4 ... 32.
4689 MockPackage Plus Utilities 4.4 ... 32.
1729 QuickKeys 1.2 ... 65.

Central Point

5040 Copy II Mac 7.2 ... 24.
5041 PC Tools Deluxe Mac 1.1 ... 46.

★Dantz Development ... 30 day MBG

5255 Retrospect 1.0 ... 155.

Dubl-Click Software

1824 Calculator Construction Set 1.04 ... 35.

Electronic Arts

1843 Disk Tools Plus 1.01 (Batteries Incl.) ... 31.

★Fifth Generation ... 60 day MBG

4287 PYRO! 3.3 (screen saver) ... 15.
3954 PowerStation 2.5 ... 35.
3955 Suitcase II 1.2.2 ... 45.
5178 FastBack II 1.0 ... 108.

★HJC Software ... 30 day MBG

4803 Virex 1.41 ... 59.

ICOM Simulations

4084 On Cue 1.3 ... 35.

Ideaform

2419 DiskQuick 2.10 ... 27.
2420 MacLabeler Plus 3.0 ... 42.

★Kent Marsh Ltd. ... 30 day MBG

5457 QuickLock 1.0 ... 57.
2591 The NightWatch 1.03 ... 87.
2592 MacSafe 1.08C ... 87.

★Loop Software ... 30 day MBG

5442 PictureBook ... 40.

★Lundeen & Assoc. ... 60 day MBG

2683 WorksPlus Command 2.0 ... 85.

MEDIAGENIC

4591 Open II! 1.0 ... 49.

★Microlytics ... 60 day MBG

2732 GOfer 2.0 ... 47.

★Microseeds Pub. ... 60 day MBG

4848 INITPicker 1.0 ... 27.
4210 Screen Gems 1.0 ... 42.
2913 Redux 1.5 ... 52.

Olduvai Software

4503 MultiClip 1.01 ... 51.

★PCPC ... 30 day MBG

3175 HFS Backup 3.0 ... 54.

★Solutions Int'l. ... 60 day MBG

3448 SmartScrap & The Clipper 2.1 ... \$45.
3449 SuperGlue II 2.0 ... 62.

★SuperMac Software ... 60 day MBG

3381 Sentinel 2.0 ... 89.
3383 SuperSpool 5.0 ... 59.
3382 SuperLaserSpool 2.0 ... 89.
3378 SuperLaserSpool 5-Pack 2.0 ... 295.
3377 DiskFit 1.5 ... 59.
3379 Network DiskFit 1.5 ... 229.

★Symantec ... 30 day MBG

4729 S.U.M. 1.1 ... 63.
5176 S.A.M. 1.0 ... 63.

★Williams & Macias ... 30 day MBG

3779 DiskFinder ... 29.
3783 myDiskLabeler w/Color 2.9.11 ... 29.
3784 myDiskLabeler w/LaserWriter 2.9.11 ... 34.
3780 ImageWriter II Label Pack (Qty. 216) ... 16.
3781 LaserWriter Label Pack (Qty. 216) ... 20.
4976 Sticky Business 1.0.6 ... 95.

★XTree ... 30 day MBG

5177 XTreeMac 1.0 ... 52.

★Microsoft ... 30 day MBG

2885 Write 1.0 ... \$79.
4969 Word 4.0 ... 249.

★Niles & Associates ... 30 day MBG

5048 EndLink 1.0 ... 58.
4602 EndNote 1.2.1 ... 75.

★Preferred Publishers ... 30 day MBG

4781 Vantage 1.0 ... 55.

★Sensible Software ... 30 day MBG

4692 BookEnds 1.0E ... 53.
3375 Sensible Grammar 1.5 ... 53.

★Symantec ... 30 day MBG

3422 More II 2.01 ... 249.

★Symmetry ... 30 day MBG

4504 Acta Advantage 1.0 ... 65.

★T/Maker ... 30 day MBG

3639 WriteNow 2.0 ... 109.

★WordPerfect ... 60 day MBG

3800 WordPerfect Mac 1.0.2 ... 185.

Working Software

3790 Lookup 1.0C ... 30.
3788 Findswell 2.0 ... 36.
3792 Spellswell 2.0G ... 45.
4693 QuickLetter 1.0 ... 73.

MUSIC & EDUCATION

★Ars Nova ... 60 day MBG

1215 Practica Musica 2.1 ... 73.

★Bogas Productions ... 60 day MBG

1461 Studio Session 1.2 SE ... 46.
4255 Super Studio Session 2.0 ... 69.
1459 Heavy Metal Rock ... 14.
1460 String Quartet ... 14.
1458 Country Disk ... 14.
4832 Sound Effects ... 14.

Bright Star Technology

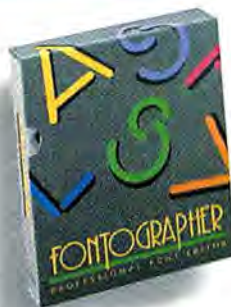
1402 Alphabet Blocks 1.0 ... 30.
3961 Talking Tiles 1.0 ... 69.

Broderbund Software

4314 Type! 1.0 ... 19.
1423 Jam Session 1.1 (CP) ... 30.
1422 Geometry 1.2 (CP) ... 59.
4067 Calculus 1.2 (CP) ... 59.
1426 Physics (CP) ... 59.

Coda Music Systems

4367 MacDrums 1.01 (CP) ... 31.
4483 Perceive 1.0 ... 50.



Altsys

Fontographer 3.0—New version! Create high-quality downloadable PostScript fonts, logos, and more. Tools like auto-trace, bezier curves, and an integrated bitmap editor make it easy. Just add your imagination ... \$219.

WORD PROCESSING

★A Lasting Impression ... 30 day MBG

5465 ResumExpert (reqs. MS Word 3+) ... 49.

★Access Technology ... 60 day MBG

3959 MindWrite 2.1 ... 95.
4109 MindWriteExpress 2.1 ... 129.

★Aegis Development ... 60 day MBG

1133 Word Tools 1.2 ... 42.

Ashton-Tate

1324 FullWrite 1.0 ... 259.

Claris

1129 MacWrite II ... 185.

★Deneba Software ... 30 day MBG

4700 BigThesaurus 1.0 ... 59.
1767 Comment 2.0 ... 59.
1768 Coach Professional 3.0C ... 115.

Electronic Arts

1543 Thunder II 1.0 (Batteries Included) ... 52.

★Lundeen & Assoc. ... 60 day MBG

2684 WorksPlus Spell 2.0 ... 57.

★Microlytics ... 60 day MBG

2733 Word Finder 2.0 ... 36.
4870 Electronic WordFinder 220 ... 75.



Dove Computer ... 60 day MBG

FastNet LAN 020—Combines the speed of the 68020 accelerator with the convenience of FastNet connectivity to create a powerful workstation from your Mac SE. See line listing.

or study the past.



Kensington ... 30 day MBG

Mac II Stand & Cable Kit—Everything you need to get the Mac II off your desk and out of your way. Monitor and keyboard extension cables allow you to position your monitor up to eight feet away from your CPU. . . . \$65.

Davidson & Associates

- 1734 Math Blaster! 1.0 (CP) 27.
- 4978 Speed Reader II 1.0 (CP) 36.

Electronic Arts

- 4619 Mavis Beacon Typing 1.2B (CP) 33.
- 1846 Deluxe Music Construction Set 2.5 84.

First Byte

- 5294 The Puzzle Storybook 1.0 (ages 3-8) 27.
- 5293 Dinosaur Discovery Kit 1.0 (ages 3-8) 27.
- 3941 SmoothTalker 2.1 33.
- 3935 Speller Bee 2.0 33.
- 3936 KidTalk 2.0 33.
- 3939 MathTalk 2.0 33.
- 3940 First Shapes 2.0 33.

*Great Wave ... 30 day MBG

- 2277 TimeMasters 1.0 22.
- 2276 KidsTime 1.2 26.
- 4334 NumberMaze 1.0 26.
- 2273 ConcertWare+ 4.0 38.
- 2271 ConcertWare+ MIDI 4.0 78.

Learning Company

- 2670 Reader Rabbit 2.1 (CP) 31.
- 5453 Talking Math Rabbit 1.0 31.

Mindscape

- 2748 The Perfect Score: SAT 1.0 32.

*Personal Training Sys. ... 60 day MBG

Excellerate Training Series

- 4946 E1 Beginning Spreadsheets 29.
- 5091 E2 Creating Business Graphs 29.
- 4858 E3 Intermediate Spreadsheets 29.
- 5092 E4 Building Databases 29.
- 5093 E5 Beginning Macros 29.
- 5094 E6 Linking Spreadsheets 29.
- 5095 E7 Advanced Spreadsheets 29.
- 5099 E8 Advanced Macros 29.

MacTeach Training Series

- 5263 B1 The Basics (for 2 floppy drives) 39.
- 5264 B2 The Basics (for Plus or SE w/HD) 39.
- 5265 B3 The Basics (for Mac II w/HD) 39.
- 5266 B4 Beyond the Basics 39.

LearnWord Training Series

- 4947 W1 Beginning Level \$39.
- 4854 W2 Intermediate Level 39.
- 5098 W3 Advanced Level 39.
- 5418 W4 Additional Features 39.

LearnPersuasion Training Series

- 5269 LP1 Beginning Persuasion 39.
- 5270 LP2 Intermediate Persuasion 39.
- 5271 LP3 Creating AutoTemplates 39.
- 5272 LP4 Creating Artwork 39.

HyperEasy Training Series

- 5194 H1 Using HyperCard 39.
- 5195 H2 Creating Cards & Stacks 39.
- 5267 H3 Basic Scripting 39.
- 5268 H4 Advanced Scripting 39.

PageTutor Traing Series

- 4852 P1 Beginning PageMaker 39.
- 4853 P2 Intermediate PageMaker 39.
- 5096 P3 Tips & Techniques 39.
- 5097 P4 Advanced Features 39.

MasterWorks Training Series

- 5196 M1 Database & Form Letters 39.
- 5197 M2 Advanced Database 39.
- 5273 M3 Spreadsheets 39.
- 5274 M4 Word Processing 39.

Learn88 Training Series

- 5259 A1 Beginning Illustrator 39.
- 5260 A2 Intermediate Illustrator 39.
- 5261 A3 Creating Special Effects 39.
- 5262 A4 Precision Drawing Techniques 39.

*Simon & Schuster ... 60 day MBG

- 3305 Typing Tutor IV 1.2 34.

*Spinnaker ... 30 day MBG

- 2329 SAT Score Improvement 1.0 (CP) 57.

Microseeds Publishing ... 60 day MBG

Redux 1.5—Super-fast and flexible backup utility. Allows you to choose which folders and files to backup, perform incremental backups, and even write scripts to control the whole process. \$52.

*Springboard ... 30 day MBG

- 4493 Atlas Explorer (CP) \$28.

*Think Educational ... 60 day MBG

- 3615 MacEdge II 1.0 (CP) 27.
- 3616 Mind Over Mac 1.4 (CP) 27.

*Unicorn ... 30 day MBG

- 3751 Animal Kingdom (CP) 27.
- 3756 Math Wizard (CP) 27.
- 3753 Fraction Action (CP) 27.
- 3755 MacRobots (CP) 27.
- 3754 Read-A-Rama (CP) 32.

Monogram ... 30 day MBG

Business Sense 1.2—An easy-to-use integrated accounting package with GL, AR, AP, Payroll, Budgeting and Invoicing. Controls up to 99 departments, 2000 customers, 1500 vendors, and 50 employees. . . . \$269.

ENTERTAINMENT

Access Software

- 4655 World Class Leader Board Golf 27.

Activision

- 4475 Quarterstaff (CP) 30.
- 4679 Universal Military Simulator 30.
- 4486 Manhole 30.
- 5127 Manhole (CD ROM) 35.
- 4490 Might & Magic (CP) 35.
- 4592 Zork Zero (CP) 35.

Addison-Wesley

- 4407 The Hobbit (CP) 24.
- 4474 Fellowship of the Ring (CP) 24.

Broderbund Software

- 4099 Shufflepuck Cafe (CP) 24.
- 4965 Auto Duel (CP) 27.
- 1421 Ancient Art of War (CP) 27.
- 4540 Ancient Art of War at Sea (CP) 27.
- 4229 Where/World Carmen Sandiego? (CP) 27.
- 5233 Where/USA Carmen Sandiego? (CP) 29.
- 4966 SimCity 1.1 (CP) 29.

Bullseye

- 1544 Ferrari Grand Prix (CP) 32.
- 4074 P51 Mustang Flight Simulator (CP) 32.

*Casady & Greene ... 60 day MBG

- 2268 Crystal Quest 2.2T 25.
- 4119 Crystal Quest w/Critter Editor 2.2T 41.

So get down!



Chang Labs ... 60 day MBG

C.A.T. 2.0—A lightning-fast relational database for managing your contacts; tracking facts, figures, events, and projects; writing letters; and performing mailmerges. \$229.

★Discovery Software ... 30 day MBG

4408 Arkonoid. 26.

Electronic Arts

1842 Chessmaster 2000 (CP) 28.

4064 Chuck Yeager Flight Simulator 32.

4588 Life & Death (CP) 32.

4945 The Hunt for Red October. 32.

Epyx

2037 Sub Battle Simulator 29.

4660 Sub Battle Simulator for Mac II 29.

MicroProse

4697 Pirates! (CP) 35.

★Microsoft ... 30 day MBG

2868 Flight Simulator (CP) 33.

Miles Computing

5253 The Puzzle Gallery 27.

2765 Fool's Errand (CP) 32.

2767 Harrier Strike Mission II (CP) 32.

Mindscape

4083 Balance of Power 1990 (CP) 30.

3987 Colony (CP) 30.

4596 Deja Vu II (CP) 30.

2743 Crossword Magic (CP) 30.

5429 Aussie Joker Poker (CP) 30.

2749 Shadowgate (CP) 30.

5252 Gauntlet (CP) 30.

2751 Uninvited (CP) 30.

2750 Siboot: Trust & Betrayal (CP) 30.

PCAI

3144 MacGolf 2.0 (CP) 34.

4320 MacGolf Classic (CP) 53.

4212 MacCourses. 20.

4321 Lunar Rescue (CP) 34.

4517 Road Racer (CP) 39.

Sierra On-Line

3397 Leisure Suit Larry (CP) 23.

5459 Gold Rush! (CP) 23.

5458 Manhunter (CP) 29.

3396 King's Quest III (CP) 29.

★Silicon Beach ... 60 day MBG

3502 Beyond Dark Castle 32.

3501 Apache Strike. 32.

3503 Dark Castle. 32.

Sir-Tech

3347 Mac Wizardry (CP) 35.

★Softstream Int'l., Inc. ... 60 day MBG

4071 Mac•Man (w/adaptor) 23.

4072 The Solitaire DA 23.

4995 Cribbage Tutor \$26.

4073 Colour Billiards 38.

★Spectrum Holobyte ... 30 day MBG

4175 Solitaire Royale (for Mac SE) 19.

4001 Solitaire Royale (for Mac II) 19.

3464 Tetris. 20.

4472 Tetris (color version) 24.

3462 PT-109 26.

3460 GATO 26.

3459 Falcon 2.0. 31.

★Spinnaker ... 30 day MBG

2328 Sargon IV (CP) 29.

★Springboard ... 30 day MBG

4988 Hidden Agenda 36.

★SubLogic ... 60 day MBG

4698 Jet (CP) 32.

NETWORKS & COMMUNICATIONS

★Abaton ... 30 day MBG

4589 InterFAX Modem 349.

★CE Software ... 60 day MBG

5174 QuickMail (5 user Pak) 175.

5173 QuickMail (10 user Pak) 259.



Chang Labs ... 60 day MBG

Rags to Riches 3 Pak Special—One of the Mac's first and best accounting packages. Includes AR, AP, & GL. Buy before Sept. 30, 1989, and receive your choice of Professional Billing or Inventory Control FREE! \$289.

★CompuServe ... 60 day MBG

1676 CompuServe Information Service 24.

1673 CompuServe Navigator 3.0 45.

1674 Standard Service/Navigator Bundle 59.

Connect, Inc.

5445 MacNet. 47.

★DataViz ... 60 day MBG

1823 MacLink Plus/PC 4.0 139.

4842 MacLink Plus/Translators 4.0 115.

★Dove Computer ... 60 day MBG

4939 FastNet III. 450.

4938 FastNet SE 450.

4937 FastNet SCSI 925.

★Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Pack. 24.

1785 Desktop Express 1.03 95.

★Farallon Computing ... 30 day MBG

4208 Timbuktu 2.0.1 65.

4866 Timbuktu Remote 1.0.1 195.

4867 Timbuktu 30-Pack 2.0.1 1325.

2201 TrafficWatch 1.08. 135.

2202 PhoneNET to LocalTalk Adapter 9.

2203 PhoneNET PLUS (DIN-8) 35.

2204 PhoneNET PLUS (DB-9) 35.

5251 PhoneNET CheckNET \$65.

4869 PhoneNET Connector 10-Pack 215.

4868 PhoneNET Repeater 325.

2206 PhoneNET StarController 1095.

2205 Star Wiring Kit (Punchdown) 65.

5455 Star Wiring Kit (Harmonica) 65.

★Freesoft ... 60 day MBG

2219 Red Ryder 10.3 52.

Hayes

2300 Smartcom II 3.1 88.

2307 Smartmodem 2400. 429.

5170 2400M (internal) 419.

5169 2400M (internal w/Smartcom II) 459.

Insignia Solutions

4089 SoftPC 1.3 249.

Intel Corporation

5119 2400 Baud External Modem 179.

★Lamir ... 30 day MBG

4984 Acknowledge 1.0. special 289.

★Microsoft ... 30 day MBG

2875 Microsoft Mail 1.37 (1-4 users) 195.

2872 Microsoft Mail 1.37 (5-10 users) 325.

2873 Microsoft Mail 1.37 (11-20 users) 489.

2874 Microsoft Mail 1.37 (21-32 users) 625.

★Nuvotech ... 60 day MBG

3000 TurboNet ST (DIN-8) 30.

3001 TurboNet ST (DB-9) 30.

★Practical Peripherals ... 30 day MBG

3100 1200 Baud External Modem 77.

3102 2400 Baud External Modem 179.

3089 Mac Communications Pack 1.5 225.

★Shiva ... 30 day MBG

3444 NetSerial X232 279.

4347 NetBridge. 349.

4942 TeleBridge 349.

3443 NetModem V2400 439.

★Software Ventures ... 30 day MBG

3454 MicroPhone 1.5. 115.

3455 MicroPhone II 3.0 219.

★Solutions Int'l. ... 60 day MBG

4308 BackFAX (reqs. Apple FAX modem) 125.

★Synergy ... 30 day MBG

3130 VersaTerm 4.0. 89.

3131 VersaTerm-PRO 3.0. 175.

★TOPS ... 30 day MBG

4188 TOPS Teleconnector (DIN-8) 29.

4189 TOPS Teleconnector (DB-9) 29.

3726 TOPS for DOS 2.1 115.



Digitaltalk ... 60 day MBG

SmallTalk V Mac 1.0—The original object-oriented development environment. Extensive manual and tutorial. Easy integration with other languages. Complete toolbox access. MultiFinder friendly. \$129.

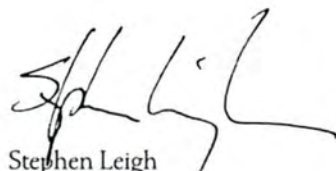


"The Warranty From Hell."

Dear MacConnection,

When I tried to boot my new *Thunder-Scan* program from MacConnection, all I got was a fearsome bomb. I'd heard horror stories about mail order, and thought, great, it's my very own double feature: "Night of the Undead Hardware" and "The Warranty From Hell."

But, I called your toll-free Technical Support Line. I explained the problem to Paul, who suggested there was a ROM incompatibility problem. He confirmed this diagnosis with Thunderware. The solution was shipped to me. No "Warranty from Hell." Just a pleased customer who will definitely use you again.


Stephen Leigh
Cincinnati, OH

MacConnectionTM 1-800/622-5472

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/622-5472 603/446-7711 FAX 603/446-7791

© Copyright 1989 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc., Marlow, NH.

Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!

money-back guarantee.

High Density Disks

★Verbatim ... 30 day MBG

3773	3 1/2" HD Disks (1.44 Meg)	\$32.
3298	Sony 3 1/2" HD Disks (1.44 Meg)	32.
2793	MAXELL 3 1/2" HD Disks (1.44 Meg)	32.

Tape Cartridges

3943	3M DC2000	25.
3944	3M DC600A	29.

ACCESSORIES

★Avery ... 60 day MBG

4864	Disk Labels 3 1/2" (Qty. 250)	13.
5392	Disk Labels—Laser 3 1/2" (Qty. 630)	29.
5403	Address Labels 1 7/16" x 4" (Qty. 1000)	9.
4865	Address Labels 3 1/2" x 1 5/16" (Qty. 3750)	15.
4811	Transparencies 8 1/2" x 11" (Qty. 50)	22.
4813	Round Labels 3 1/3" (Qty. 150)	7.
4812	Laser Labels 1 1/2" x 1 3/4" (Qty. 2000)	7.
4807	Laser Labels 1" x 2 5/8" (Qty. 3000)	24.
4808	Laser Labels 1 1/2" x 4" (Qty. 1400)	24.
4809	Laser Labels 2" x 4" (Qty. 1000)	24.
4810	Laser Labels 8 1/2" x 11" (Qty. 100)	24.

★Computer Coverup ... 60 day MBG

1722	ImageWriter LQ Cover	8.
1723	ImageWriter II Cover	8.
1720	Mac Plus Cover	10.
1724	Mac SE Cover	10.
1725	Mac SE Ext. Keyboard Cover Set	10.
4657	LaserWriter II Cover	10.

★Goldstein & Blair ... 30 day MBG

2267	The Macintosh Bible (2nd Edition)	20.
------	-----------------------------------	-----

★I/O Design ... 30 day MBG

2379	MacLuggage Imageware II	49.
2376	MacLuggage Macinware Plus	64.
2381	MacLuggage Macinware SE	75.

Kalmar Designs

2531	Teakwood Roll-top Case (holds 45 disks)	14.
2532	Teakwood Roll-top Case (holds 90 disks)	21.
2533	Teakwood Roll-top Case (holds 135 disks)	31.

★Kensington ... 30 day MBG

MacConnection carries the entire line of Kensington's accessories. Partial listing below.

2577	Mouseway Pad	8.
2569	Mac SE Ext. Keyboard Cover Set	9.

2558	ImageWriter II Dust Cover	\$9.
2589	Universal Printer Stand	15.
2545	Universal Copy Stand	22.
2573	Tilt/Swivel (platinum)	22.
4126	LaserWriter II Dust Cover	17.
4971	Modem/FAX Protector 20	25.
4973	Power Tree 20	27.
4974	Power Tree 50	54.
2559	Apple Security Kit	34.
2568	Maccessories SuperBase	34.
2585	Printer Muffler 80	43.
4070	System Saver SE	52.
2566	System Saver Mac (platinum)	64.
2567	System Saver Mac (beige)	64.
2546	A-B Box (DIN-8)	64.
2556	Maccessories Anti-Glare Filter	33.
5064	Apple Color Monitor Polarizing Filter	65.
5065	Full Page Display Polarizing Filter	65.
5066	Two Page Display Polarizing Filter	135.
4941	Mac II Monitor Stand	65.
4643	Mac II Stand and Cable Kit	65.
2561	MasterPiece Mac II	105.
5229	PowerBacker 330	269.
5230	PowerBacker 800	749.
5228	PowerBacker 1200	949.



Logitech ... 30 day MBG

ScanMan—Add scanned graphics to documents quickly and conveniently. Scanned images can be saved in TIFF, Compressed TIFF, PICT, and MacPaint formats. ScanMan works on the Mac Plus, SE, and II. \$349.

★MacConnection ... 60 day MBG

4623	Solid Oak Disk Case, made by New England craftsmen (holds 90 disks)	29.
------	---	-----

★Mobius Technologies ... 60 day MBG

4470	Fanny Mac QT	60.
------	--------------	-----

★Moustrak ... 60 day MBG

Available in blue or gray.

2694	Moustrak Pad (standard 7" x 9")	8.
2692	Moustrak Pad (large 9" x 11")	9.
2693	Moustrak Pad L/F (9" x 11")	10.

Ribbons

Available in black, blue, brown, gold, green, orange, purple, red, silver and yellow.

3255	ImageWriter II Ribbon	4.
3261	ImageWriter II 4-Color Ribbon	9.
3270	ImageWriter II Rainbow Six Pack	20.
3260	ImageWriter LQ Black Ribbon	17.
4011	ImageWriter LQ 4-Color Ribbon	20.

★Sopris Softworks ... 60 day MBG

4171	Mac SE Std. Keyboard Cover (navy)	15.
4019	Mac SE & Ext. Keyboard Cover (navy)	15.
4017	ImageWriter II Cover (navy)	11.



SuperMac Technology

DataFrame Drives feature automatic data encryption and password-lockable SCSI partitions for faster operation, protection from accidental deletion, and virus attacks. Includes DiskFit, SuperSpool, & SuperLaserSpool. See line listing.

4168	ImageWriter LQ Cover (navy)	\$13.
4018	LaserWriter II Cover (navy)	17.
4012	High Trek ImageWriter II carry case	49.
4013	High Trek Mac Plus carry case	59.
4014	High Trek Mac SE & ext. kybd. case	69.
★Targus ... 60 day MBG		
3618	ImageWriter II Carry Case	49.
3617	Mac Plus/SE Carry Case	59.
4015	Mac SE & Ext. Kybd. Carry Case	75.

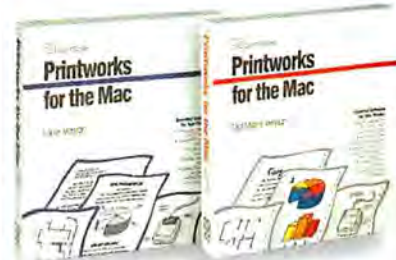
OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail.
- International orders U.S. \$250 minimum.
- Upon receipt and approval, personal and company checks now clear the same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to credit approval.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices subject to change without notice.
- To order, call us anytime Monday through Friday 9:00 to 9:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all credit card orders phoned into MacConnection weekdays by 8 PM EST will ship Airborne the same night for delivery the next business day (i.e. not Saturday or Sunday), except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now \$3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.

Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.



Softstyle

Printworks—Laser version provides compatibility with HP and other Lasers. Dot matrix version prints faster and in color on the Imagewriter.

Printworks 3.5 (Dot Matrix)	\$43.
Printworks 3.6 (HP Laser)	\$85.

with our 30-60 day



Olduvai
PLUS 1.1—HyperCard compatible multimedia software toolkit. Supports 256 colors, animation, cards of any size, irregularly shaped buttons, word buttons, full text styling, database fields, and more . . . \$115.

4598	TOPS FlashBox	125.
3725	TOPS Repeater	129.
3723	TOPS Mac 2.1	145.
3720	TOPS Flashcard	159.
3724	NetPrint 2.0	119.
4714	InBox Starter Kit 2.2	149.
4715	InBox Connection Mac 2.2	49.

★Traveling Software ... 60 day MBG		
3729	LAP-LINK Mac 2.0	83.

INPUT/OUTPUT

Caere		
4476	OmniPage 2.0	559.
★Cutting Edge ... 30 day MBG		
3988	CE 105ADB Keyboard w/QuickKeys	135.
★Datadesk ... 30 day MBG		
1818	HyperDialer	24.
1819	MAC-101 Keyboard (beige)	139.
1820	MAC-101 Keyboard (platinum)	139.
1821	MAC-101 Keyboard (ADB)	139.

★Kensington ... 30 day MBG		
2576	Turbo Mouse for Mac Plus 3.0	109.
2547	Turbo Mouse ADB 3.0	109.

Koala		
2593	MacVision 2.0	219.

★Kraft Systems ... 60 day MBG		
2600	3-Button QuickStick	39.
4082	3-Button QuickStick ADB	51.

Kurta		
2604	IS ADB 8 1/2" x 11" Tablet	255.
5161	IS ADB 12" x 12" Tablet	385.
5162	IS ADB 12" x 17" Tablet	625.
2605	Cordless 4 Button Cursor	65.

★Logitech ... 30 day MBG		
5082	ScanMan Mac	349.

★LYNX Computer ... 30 day MBG		
1211	LYNX Trackball	65.
1212	LYNX Trackball ADB	65.

★Microseeds Pub. ... 60 day MBG		
4843	WristMac 1.0	149.
5018	WristMac Executive 1.0	199.

★Mobius Technologies ... 60 day MBG		
4846	MultiScreen	315.

★Mouse Systems ... 30 day MBG		
2808	A+ Mouse	63.
2809	A+ Mouse ADB	83.

★Nutmeg Systems ... 30 day MBG

4849	LCD Interface (Kodak DataShow) \$399.
2993	15" Monitor for Mac IIspecial 799.
2992	15" Monitor for Mac Plus 999.
2994	15" Monitor for Mac SE 999.
4002	19" Monitor for Mac Plus 1349.
4096	19" Monitor for Mac SE 1349.
4097	19" Monitor for Mac II 1349.

Olduvai Software

5138	Read-It! OCR Personal 2.0 99.
3034	Read-It! OCR 2.1 249.

★Orange Micro ... 30 day MBG

4488	Grappler Spooler 39.
3036	Grappler C/Mac/GS 2.0 79.
4076	Grappler LQ 1.5 103.
4487	Grappler LS 1.0 103.

★PTI/DataShield ... 30 day MBG

4845	MacDirector 109.
SoftStyle	
3282	Printworks 3.5 (Dot Matrix) 43.
3281	Printworks 3.0 (Daisywheel) 56.
3283	Printworks 3.6 (HP laser) 85.
Summagraphics	
4298	BitPad Plus ADB 325.

★Thunderware ... 30 day MBG

3648	ThunderScan 5.0 with PowerPort 189.
4994	LightningScan 409.
3645	Mac II Power Accessory 45.

MEMORY & DRIVES

1 Meg SIMMs		call
--------------------	--	------

★Cutting Edge ... 30 day MBG

3989	800k External Disk Drive 149.
5133	20 Meg Hard Drive 439.
3990	30+ Meg Hard Drive 499.
3991	45+ Meg Hard Drive 549.
5275	65+ Meg Hard Drive 629.
5276	80+ Meg Hard Drive 739.
5456	45 Meg Removable Drive 999.

★Dove Computer ... 60 day MBG

1802	Dove Tool Kit 15.
1801	SCSI Interface/Port 109.
5103	Mac II Power Pack (includes Marathon 030 32MHz Accelerator, four 1 Meg SIMMs, and RamSnap) 1799.
1807	MacSnap 524E 189.
1809	MacSnap 524S 239.



Targus ... 60 day MBG
Mac SE & Ext. Keyboard Case—Made of a dust & water-resistant material as strong as Cordura but smoother so it won't wear out clothes. Closed-cell foam protects against jolts. . . . \$75.
ImageWriter II Carry Case 49.

1811	MacSnap 548E	\$419.
1812	MacSnap 548S	479.
1800	MacSnap 2SE	319.
1797	MacSnap Plus 2	319.
1804	MacSnap 2S	369.
1805	MacSnap 4S	729.



Datadesk ... 30 day MBG

MAC-101 Keyboard—Includes macro program, Masterstrokes, to assign keystrokes and mouse clicks to 15 function keys. Beige, platinum, or ADB version \$139.
Foreign keyboards are also available call

ACCELERATOR BOARDS

1793	MaraThon 020 MSE1	429.
1794	MaraThon 020 MSE2 (1 Meg)	719.
1795	MaraThon 020 MSE3 (math chip)	599.
1796	MaraThon 020 MSE4 (1 Meg/chip)	899.
5192	MaraThon 020 MSE5 (4 Meg)	1269.
5193	MaraThon 020 MSE6 (4 Meg/chip)	1449.
4663	MaraThon 030 Accelerator 32 MHz	969.

ACCELERATORS (020) W/ETHERNET

5391	FastNet LAN 1	1125.
5390	FastNet LAN 2 (1 Meg)	1499.
5389	FastNet LAN 3 (math chip)	1349.
5388	FastNet LAN 4 (1 Meg/chip)	1724.
5387	FastNet LAN 5 (4 Meg)	2175.
5386	FastNet LAN 6 (4 Meg/chip)	2399.

Epson

5132	40 Meg Raw Drive (25ms)	436.
5204	70 Meg Raw Drive (25ms)	586.

★LaCie, Ltd. ... 30 day MBG

4983	Maxcie Internal Drive Kit	59.
4982	Maxcie External Drive Kit	189.

★PCPC ... 30 day MBG

3177	HD-WSI (Apple HD-20 to SCSI)	199.
3189	MacBottom HD 45 SCSI	call
4658	MacBottom HD 84 SCSI	call

SuperMac Technology

5452	Dataframe 20	599.
5447	Dataframe XP 30	749.
5448	Dataframe XP 60	1059.
5449	Dataframe XP 100	1419.
5450	Dataframe XP 150	1949.
5451	Dataframe XP 330	2849.

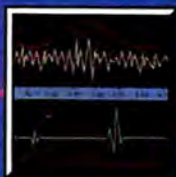
STORAGE MEDIA

Double Sided Disks

★Verbatim ... 30 day MBG

3772	3 1/2" DS/DD Disks	15.
3297	Sony 3 1/2" DS/DD Disks	15.
2792	MAXELL 3 1/2" DS/DD Disks	16.

Link Your Lab to the Mac.



Work faster and smarter with our data acquisition and control hardware/software on any Macintosh. Acquire, store, display and analyze data. Print screens and reports. You'll be amazed at how easy it is to add Macintosh power to your lab.



GW Instruments, Inc.

35 Medford St., Somerville, MA 02143

The Macintosh Data Acquisition Company

FREE 56-PAGE CATALOG 617-625-4096

Please circle 135 on reader service card.

see on the screen" is also misleading. The CODE resource contains the machine-language instructions that are executed, and these control the appearance of an application's screen.

Evan Olcott
Cincinnati

Dance 10, History 3

It sounds as if Mark Coniglio has done a masterful job of capturing dance movements as electronic signals that can be translated into music ("Audible Motion," March '89). Coniglio is not the first to do so; John Cage and the Merce Cunningham Dance Company's pioneering work in this area dates back to at least 1952.

Herbert M. Rosenthal
Albuquerque, NM

Bands Across the Water

In her May '89 column, Louise Kohl asked: "Why stop at companywide networks when we can be shooting for nationwide or worldwide networks?" We read that statement with great interest, since we are distributing a product that may help realize this dream. The product, the Samba Bridge X25, permits the liaison of two AppleTalk networks over an X.25 network (such as Telenet). X.25 networks are used worldwide; we're using one of these bridges in our Montreal offices to



Dear Mr. Sculley . . .

■ ■ ■ Your customers aren't all happy with **Apple's limited after-sale support**—and

the brief term of Apple's 90-day warranty isn't the only cause of objections to the way Apple supports its hardware. Linda Berman of Marietta, Georgia, was among the readers with some thoughts on this question (which we posed in our August '89 issue). She had some defects in her SE, which, "after an extended period of time, many letters, telephone calls, and aggravation," Apple remedied. However, after her experience, she's concluded that "it's time to support third-party products." Jacob Reider of Northampton, Massachusetts, notes that "most other computer manufacturers will sell replacement parts for major components." However, when the head in his 800K disk drive became misaligned—for the fifth time—his Apple dealer insisted that the only option was to replace the \$300 drive. "So I have replaced 100 percent of the drive, even though only 10 percent was broken."

■ ■ ■ and regarding the way in which DAs will fit into the System architecture, Denny Schlesinger of Help Software reports that no sooner did Apple disclose the details of System 7.0—reassuring users that DAs will survive—than rumors began flying that Apple would drop them in the next System release.

"Don't you dare!!!" says Ken Pruitt, vice-president of Apple Mousse, the north-

ernmost Mac users group (in Fairbanks, Alaska). "There are too many DA junkies out here for such foolishness." He also sent his list of modest proposals and complaints for future Macs:

1. The screen is 1 inch too narrow.
2. Newer systems should run faster and should take up less space.
3. Newer printer drivers should work better than older ones, and they shouldn't ever make the printer scroll backward.
4. Folders' windows should show the amount of space that folder takes up; only disk windows should show the amount of space left.
5. The entry-level Mac should have 2 megabytes of RAM and two disk drives and sell for less than \$2,000 (with printer, cables, keyboard, MacPaint, MacWrite, MacDraw, 200 sheets of paper, and a videotape showing how it all works).

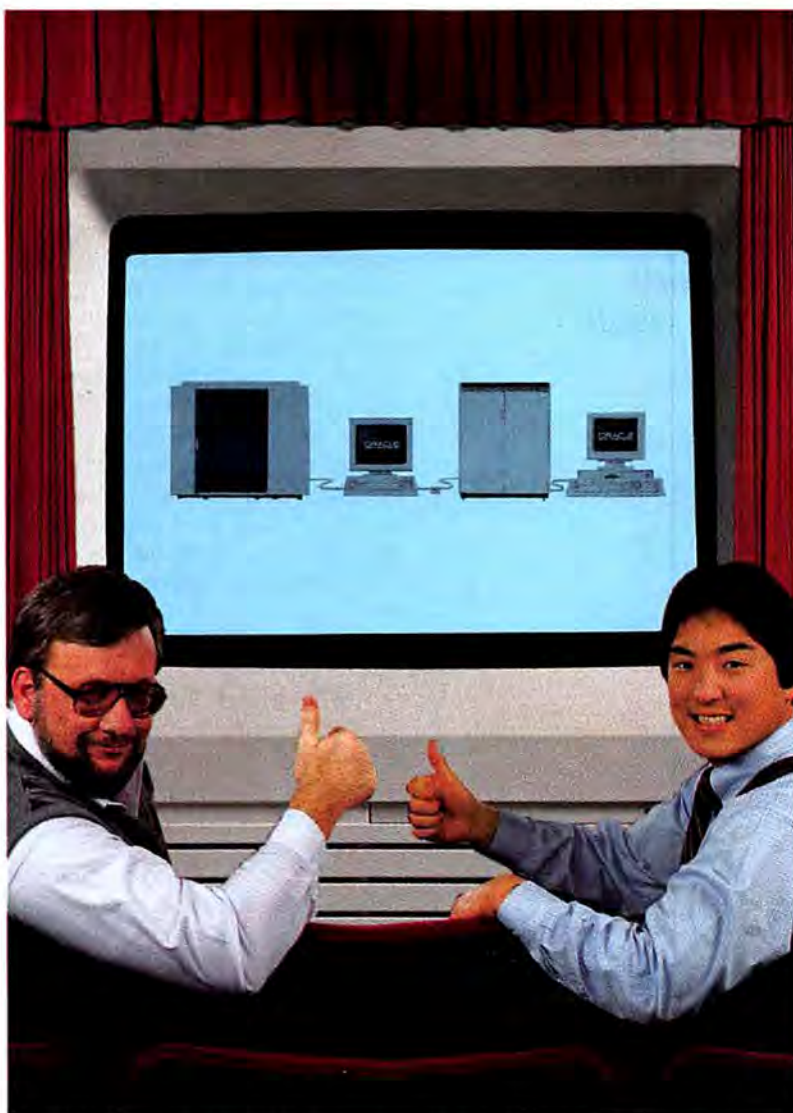
Speak Up: When Apple releases System 7.0, users without the required hardware platform (2 megabytes of RAM and 128K ROMs, plus paged-memory-management units for virtual memory) could be left behind with 6.0.

Are dueling operating systems a reasonable way to deal with the continual evolution of hardware, or is it just an invitation to chaos?

Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.



"Two thumbs up!" ORACLE for Macintosh. Only \$299.



"I like the seamless way ORACLE gives HyperCard full-power database and networking capabilities. Teaming the total flexibility of HyperCard with the strength of SQL is a masterstroke!"

Dan Shafer, Author of Hypertalk Programming

"I like the seamless way ORACLE opens up minis and mainframes to 4th DIMENSION. Teaming the total flexibility and strength of 4th DIMENSION with SQL is a masterstroke, indeed."

Guy Kawasaki, President of ACIUS, developers of 4th DIMENSION

Finally, there's one thing these two guys can agree on: ORACLE® for Macintosh. That's because ORACLE for Macintosh now turns both HyperCard and 4th DIMENSION into full-function SQL databases. It also gives them transparent connectivity to over 80 different systems, including PCs, DEC VAXs and IBM mainframes—even IBM DB2 and SQL/DS databases.

Special Limited Time Offer

Whatever application you're currently using—HyperCard or 4th DIMENSION—ORACLE for Macintosh gives you industry-standard SQL. And for a limited time, ORACLE for 4th DIMENSION is included *free* with every copy of ORACLE for Macintosh. \$299* delivers our stand-alone version for your Macintosh. \$999** delivers all this, plus transparent access to remote ORACLE and IBM databases on your host systems. So call today. Our 30-day money-back guarantee is your assurance we'll deliver a four-star performance. ★★★★★ — MacUser, 6/89

ORACLE®
COMPATIBILITY • PORTABILITY • CONNECTABILITY

Call 1-800-ORACLE1, ext. 7635 today.



Dear Oracle Macintosh Direct Sales
20 Davis Dr. • Belmont, CA 94002 • 1-800-ORACLE1, ext. 7635

I have (check one) ☐ HyperCard 1.2 ☐ 4th DIMENSION Version 1.0.6.
Enclosed is my ☐ check, or ☐ VISA ☐ MasterCard ☐ AmEx credit card
authorization for:

- × \$299 ORACLE for Macintosh Developer's Version \$ _____
(Includes HyperCard Interface, ORACLE for 4th DIM.)
- × \$199 ORACLE for 4th DIMENSION \$ _____
Available June 1989. (I already have ORACLE for
Macintosh and 4th DIMENSION.)
- × \$999 ORACLE for Macintosh Networking Version \$ _____
(Includes unrestricted license of ORACLE for Macintosh,
SQL/Net Networking Software, protocols for Macintosh
and, for a limited time, ORACLE for 4th DIMENSION.)

Please add appropriate sales tax \$ _____

Shipping and handling \$ 15.95

Total (Offer valid only in USA) \$ _____

NAME _____ TITLE _____

COMPANY _____

STREET (no P.O. boxes, please) _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

CREDIT CARD NO. _____ CARD EXPIRATION DATE _____

SIGNATURE _____ TODAY'S DATE _____ MACUSER MAG

*Stand-alone version licensed for developers only. Requires Macintosh SE or II with 2MB of RAM, 5MB hard disk space, floppy disk drive, and HyperCard 1.2. Includes 30-day installation support, ORACLE database, Hyper-SQL (HyperCard interface), SQL-Plus, OCI and Pro-C (Macintosh Programmer's Workshop required for programming usage), System Stacks and Example Stacks. **Full networking version is \$999 and includes SQL-Net (for database communications), Async 3270, DECnet, TCP/IP support, Avisa Systems' TSSnet DECnet protocol and drivers and Kinetics' TCP/IP protocol and driver. Accessing database software on other machines requires a separate protocol handler and gateway software for the other machine. Call for additional information. Copyright © 1989 by Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. The other companies mentioned own numerous trademarks. TRBA

QUICK CHANGE ARTIST.

You need a gray scale scanner for your Mac. So you go to your ImageWriter.[®] Pop out the ribbon cartridge. Snap in ThunderScan.[®] Insert your artwork. And quicker than you can say Van Gogh, you're already going.

ThunderScan lets you import quality images into all painting, drawing and desktop publishing programs. Contrast and brightness are fully adjustable. And now ThunderScan 5.0 loads TIFF files and lets you display and edit grays on your Mac II.

Priced at just \$249, ThunderScan proves you can become an artist, with just a little change.



ThunderScan[®]
FOR MACINTOSH

21 Orinda Way, Orinda, CA 94563
415/254-6581 FAX: 415/254-3047

ThunderScan is compatible with the Macintosh 512K enhanced, Plus, SE and Mac II and all ImageWriter models except the IQ. Use on the Mac II requires our Power Accessory for Macintosh II. ThunderScan, Thunderware and its logo are trademarks of Thunderware, Inc. Macintosh and ImageWriter are trademarks of Apple Computer, Inc. ©1989 Thunderware, Inc.



Please circle 195 on reader service card.



link our AppleShare-based network with our French partners in Nice.

**Jean-Pierre
Boudreau
R&D Manager
Services T.I.C. inc.
Montreal**

The Pain in Spain

A couple of days ago, I finally got my hands on the April issue of *MacUser*. It takes a while for American periodicals to reach us in Spain. I suppose I could get it faster somehow, but I enjoy the adventure of going from newsstand to newsstand to see which one gets it first. Once I'd purchased it, I did what I always do — tear open the back cover to get at the sage words of John Dvorak. "This will be my last column for *MacUser*." I was flabbergasted! I read on, increasingly upset by the thought that dear John felt he'd been hounded out by hate mail. I was shaking my head and muttering, "No, no, no — you can't stop." Spaniards browsing in the newsstand must've thought a relative of mine had died.

Then I came to "Oh, and one more thing: April Fool's."

After I'd laughed for ten minutes, in relief and appreciation, I reflected on how valuable John's column and your magazine have been to me — and that's no April Fool's.

**Linn Peterson
Madrid**

We're airmailing this issue to you but suspect the pilot will be confused by your letter. After all, John's reign in Spain fools many on the plane. — JZ

DOS He or DOSn't He?

Paul "Mr. DOS" Somerson is now the editor-in-chief of *MacUser*? Does he really now support the Mac, or will we get *MacUser* in 16-bit emulation?

Hmm. I just realized that DOS (or ex-DOS) folks populate both the front and back ends of *MacUser* now. Again — hmmm!

**Mike McKown
Benicia, CA**

Yes. And no. — PS

NEW SUM II PROTECTS YOUR DATA, INSIDE AND OUT.



Recovers lost data on floppies and crashed hard disks. Repairs crashed hard disks in minutes with new SUM Quick Fix.

Protects your data against hard disk crashes and file deletions with an automatically updated hard disk "map."

Speeds up hard disks. Optimizes, defragments, erases free space, verifies data, and locks out bad sectors to keep disks fast and safe.

Provides complete data security. Creates hard disk partitions which you can encrypt and password protect. Encrypt files, folders, and entire volumes. Secure data with two forms of DES encryption.

No learning required. Easy user interface makes repair, recovery and hard disk tune-up a snap. Just tell SUM II what you want to do, and its new Disk Clinic automatically launches the utility you need.

Backs up hard disk data fast, and allows incremental backups, from one file to entire hard disks. Back up to floppies, other hard disks, and tape drives.



For its unparalleled data protection, SUM™ won MacUser's 1989 Editor's Choice, Macworld's 1989 Reader's World Class Award, and MacUser's Highest Rating, Five Mice. New SUM II is even better. Inside, SUM II features an improved Shield, the automatic data protection and recovery utility that has won over critics and Fortune 500 users alike.

Outside, SUM II extends its data recovery power by adding SUM Backup, a complete Mac backup utility which backs up selected files or entire hard disk volumes to floppies in minutes.

With SUM Shield for protection and backup disks for insurance, your data survives virtually any disaster. Because it's protected quite literally, inside and out.

See your dealer or order today:
(800) 228-4122 Ext. 685F

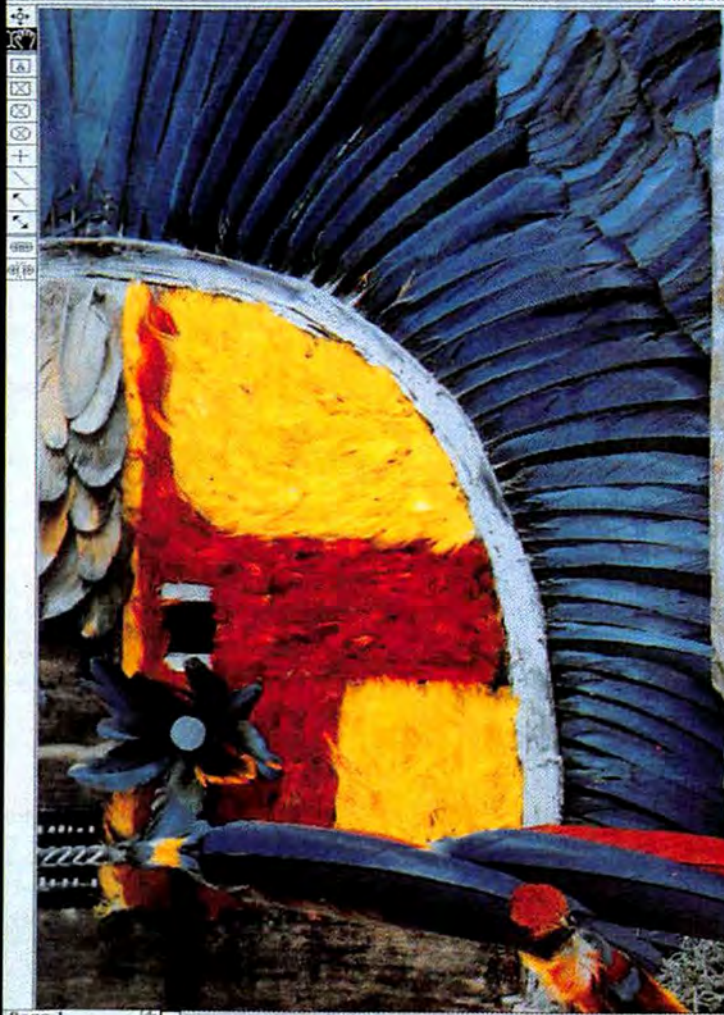
SYMANTEC



Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. 408/253-9600.
Current SUM Users, or MacZip users upgrade now to new SUM II. Call Symantec Customer Service at 408/252-3570.
SUM is a trademark of Symantec Corporation. © 1989 Symantec Corporation

See us at MacWorld Expo Booth #5104, World Trade Center

Please circle 92 on reader service card.



AMAZON C O L O



IT IS THE SE
LARGEST RIV
THE WORLD
CARRIES NE
TWENTY PER
THE WORLD
WATER TO T
OCEAN. IT S
HIGH UP IN
PERUVIAN A
AND PROVID
ONLY MEANS
TRANS PORT
THROUGH T
LARGEST RA
EST. IT IS TH
AMAZON. I
DISCOVERED
WESTERN V
1541 BY F
DE ORELLA



RADIUS PRESENTS THE TWO MOST COLORFUL PAGES IN THE HISTORY OF MACINTOSH.

Now for the first time in the history of Macintosh, you can work across two full pages with the photographic quality of 24-bit color. Introducing the Radius DirectColor™ Series.

Completely compatible with Apple's 32-bit QuickDraw, it's the precise electronic medium for working with real colors, real type and real photographs across two full pages.

With simultaneous access to every one of the Macintosh's 16.7 million colors, our Radius DirectColor/24™ is the perfect tool for retouching color photographs or producing high quality publications.

If you don't require the full Macintosh palette of colors, the Radius DirectColor/16™ lets you work with 32,768 colors simultaneously. And, upgrading to Radius DirectColor/24 is as simple as adding video RAM.

For those of you who use only 256 colors at one time, there's the 8-bit Radius Color Display™ System.

No matter which Radius color system you choose, you'll be working across-two flicker-free, paper-like pages that give you 30% more working area than commonly seen on other 19 inch displays.

Which means the view of your work is never cropped off at the sides or chopped off at the bottom.

Naturally, you'll also reap the benefits of all the classic RadiusWare™ features.

Including Tear-off Menus in every application. The ability to capture any portion of your image as a PICT file. Small or large menu bars. And direct control panel access.

So if you've been waiting to work with real colors across two real pages, visit a Radius Authorized Dealer. You can find one near you by calling 1-800-227-2795*.

And get ready to make some colorful history of your own.



The Radius Color Display showing two full pages. (1152 x 882 pixels)



Other color monitors crop off the sides and chop off the bottom. (1024 x 768 pixels)

radius

radius™
Intelligent Hardware™

*If you live outside the continental United States, call 1-408-954-6852 for the name of a Radius International Distributor.

© 1989 Radius Inc., Radius, the Radius logo, Intelligent Hardware, Radius DirectColor, Radius Color Display and RadiusWare are trademarks or registered trademarks of Radius Inc. All other brand names or trademarks or registered trademarks are the property of their respective holders.

Please circle 141 on reader service card.

THIS TEAM REWROTE A CLASSIC WITH OUR BEST-SELLER, THINK C.™



"Improving on a classic like MacWrite® was no small task," says Steve Singh, Engineering Manager for Claris® Text Products. "It took a lot of gifted developers, all working together. At breakneck speed. That's why we chose THINK C to develop the all-new MacWrite II. Its instant

INTRODUCING THINK C 4.0

- Object oriented programming support.
- Class library for implementing an object oriented Macintosh interface.
- ANSI extensions, complete ANSI standard libraries.
- Compiles up to 48,000 lines per minute*, links in < 2 seconds.
- Source level debugger with object support.
- Supports 68881/882 and 68020/030; generates 32-bit clean code.

linking and source level debugging gave us lightning-quick turn around time. And its simplicity of design allowed everyone to use all of THINK C's power the first day."

Smooth, fast work-group level developing. Just one reason professional programmers

choose THINK C over competing C implementations.

They also depend on THINK C's integrated multi-window text editor, compiler, linker, source level debugger and auto-make facility for consistently high quality, compact code. It's the professional's choice. For individuals. And groups. Steve Singh says THINK C's blazing speed and interactive performance made developing MacWrite II "a classic team-effort win."

Call (800) 228-4122 Ext. 347F for more information, or visit a dealer near you.

SYMANTEC™

The Professional's Choice.



**1989 MacUser
Eddy Award Winner**

Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. 408/253-9600.

Owners of version 3.0 or earlier please call 415/964-4440 for upgrade information. *48,000 LPM on a MAC II or an SE with accelerator. 15,000 LPM on standard SE or Plus. Program requires 1 megabyte of RAM. Debugger requires 2 megabytes RAM and MultiFinder. Hard disk strongly recommended. THINK C is a trademark of Symantec Corporation. MacWrite is a registered trademark and Claris is a trademark of Claris Corporation. Other brands and products are trademarks of their respective holders. © 1989 Symantec Corporation

Please circle 156 on reader service card.

See us at MacWorld Expo Booth #5104, World Trade Center

Over the past few years, *MacUser* has established a clear reputation as the industry's leading magazine. By a significant margin. And we're not just blowing our own horn — in independent studies, readers who subscribed to several Mac publications were asked which they would read if they could have only one. *MacUser* trounced the nearest competition by more than 3 to 1 (72 percent versus 19 percent).

That's just one of the many measurable differences that set us apart. We've succeeded by following a simple formula: We publish the most reliable, comprehensive, lab-based reviews of every important Macintosh product on the market to help you select the ones that best suit your needs.

Which is why we have more honest circulation than anyone else in the business. More than 300,000 readers pay to get each new issue. We

point (and giving you lots more of them in each issue), we'll still provide our trademark in-depth MacUser Lab Reports. Nobody does it better. And, in addition to our acclaimed Lab Reports,

we'll be publishing a brand-new series of mini Lab Reports on products that represent emerging technologies. These will be based on the same rigorous testing procedures and will provide the same unassailable results that have made MacUser Lab Reports an industry institution.

MacUser Labs will be involved throughout the entire magazine. To handle this, we're doubling the size of our product-testing lab. We don't believe in the "pizza delivery" lab approach, where magazines send out for results. To provide you with recommendations you can really trust, we need to control every aspect of the evaluation process, spot trends, and continually monitor the testing procedures. This just isn't possible when the testing is done by someone else outside the office.

We're also proud to introduce a brand-new connectivity lab,



BY PAUL SOMERSON

MacUser Friendly

don't mail copies to people who didn't request them. We don't scavenge subscribers from publications that are no longer around. Grateful Mac users tell us they're happy to pay for the criti-

cally useful information we publish. We're going to pay these readers back handsomely, in a different currency. Starting with this issue, we're taking major steps to make *MacUser* even more useful and informative.

Normally, change can be a bit daunting. But in this case we're not straying one iota from our charter; we're hewing closer to it. One of the first things you'll notice is that we'll be publishing many more reviews of the hottest, newest products. To handle this increase, we'll be significantly expanding the size of our editing and testing staffs. And we're distilling our test results into lean, crisp prose. We don't think readers should have to wade through long-winded fluff to find the critical buying information they need.

In any monthly publication, product "news" is always several months old. If you want rewritten press releases masquerading as news, there are plenty of other places out there to get it. We think you deserve better. We'd rather rush the actual products into our lab and give you the fastest, most-accurate hands-on reviews anywhere.

While we'll be keeping individual reviews concise and to the

the MacUser NetWorkShop. This separate new testing facility houses nearly two dozen Macs, as well as PS/2s, Compaq DOS clones, Sun workstations, and systems from DEC and NeXT. Proper testing of network hardware and software demands a lab of this scale. Tests done in someone's basement on a handful of Macs don't really tell you anything about actual performance, yet that's often how others are forced to do it.

The NetWorkShop will evaluate connectivity products for our increasingly popular Bridges section, as well as for our ongoing series of network features. We're also making this showplace lab and our staff of technicians available to manufacturers of connectivity products for their own testing.

You'll see other important enhancements in *MacUser* as well, including a new section called Power Tools, which shows you how to work more efficiently and use your entire system far more productively than you ever thought possible. We'll publish the very best techniques for squeezing every last bit of horsepower out of your hardware and software. We'll provide clinics on handling problems adroitly. And we'll show you tricks to make even complex tasks seem effortless.

We're also starting a new department that focuses on unheralded gems of hardware and software from smaller companies. It's important to review products from companies of all sizes. A lot of other magazines pretty much ignore products from small vendors. We don't. We understand that it's often the smaller ones that are

The changes we've implemented are simply to make the information more useful and accessible than ever.



HOW TO ELIMINATE HOLES IN YOUR HARD DISK

Each time you use your Mac, fragmentation pushes parts of files here, there and all over your hard disk. Like holes in Swiss cheese. Soon, there are more holes than cheese, your hard disk gets slower, and so does your Mac. ■ Now, there's DiskExpress, the very best Optimization software you can buy, and it's chock full of everything you need to get organized and up to speed again. Like prioritizing all your files, compacting big desktop files, graphically displaying free space, detecting potential problem areas on your hard disk, effectively erasing free space to safely prevent unauthorized file recovery plus lightning fast file defragmentation to get your files back together and whole again. ■ Also ask about MultiDisk, ALSoft's innovative new Disk Partitioner for improved disk performance, faster access and greater file protection. ■ Whether you're in a large network or you're one person with a Mac and mouse, DiskExpress and MultiDisk will make a big difference. All for a very small price. Call now for orders or the dealer nearest you, 713/353-4090.

ALSoft

ALSoft, Inc.
P.O. Box 927, Spring, TX 77383-0927
713/353-4090

Please circle 71 on reader service card.


doing the most innovative things; how else can they compete against the big guns? We also feel that such coverage will help the industry grow — every big company was once small.

Other publications cater to beginners and provide sections on starting out. All of our research has shown that *MacUser* readers are well beyond this stage; they're anything but beginners. What serious business users need most is the kind of no-nonsense technically and technologically astute recommendations that only a lab-based publication can provide.

To help you get the key information that you require, we'll soon be offering much of it electronically. *MacUser* will be providing on-line systems that will do everything from making sure that you buy the right products for your particular needs to dispensing around-the-clock technical help with hardware and software problems. And we'll be creating useful new custom software each month for you to download.

As the Mac market matures, choices proliferate. Buying decisions become far harder. Users find themselves confronted with whole new categories of products and lots of new products in each category. Mistakes can be very expensive. Now, more than ever, you need a source of information that's current, comprehensive, and reliable. One that's based on the most trusted product-testing lab in the industry.

While we've added some sections and fine-tuned others, our fundamental mission hasn't changed a bit — to help you buy products smarter and use them smarter. This is why we're continually investing so many resources in our product-testing lab and why we're starting an entire new lab to deal solely with networks. The changes we've implemented are simply to make the information more useful and accessible than ever.

We're not a coffee-table book designed to look pretty in a waiting room. We're meant to be read from cover to cover, acted upon, and filed away for future reference. Most magazines follow the industry. We want to lead it. 

H

★★★★★
DiskExpress™
Disk Optimizing
\$69.95

★★★★★
MultiDisk™
Disk Partitioning
\$69.95

★★★★★
MasterJuggler™
Resource Optimizer
\$89.95



ALSoft, MasterJuggler, DiskExpress, and MultiDisk are trademarks of ALSoft, Inc. All other trademarks acknowledged. © 1989 ALSoft, Inc. All rights reserved.

Built to scale

If you design on a Mac II, a screen that's too small will cramp your style. That's why you should be looking into a SilverView from Sigma Designs.

At 21", this landscape monitor offers the biggest viewing area anywhere. A full 16" x 12" 2-page spread including rulers and margins.

Which means you can finally work in actual size. A fact that's also made possible by SilverView's 72 dots per inch typesetting standard.

Something else should weigh in our favor.

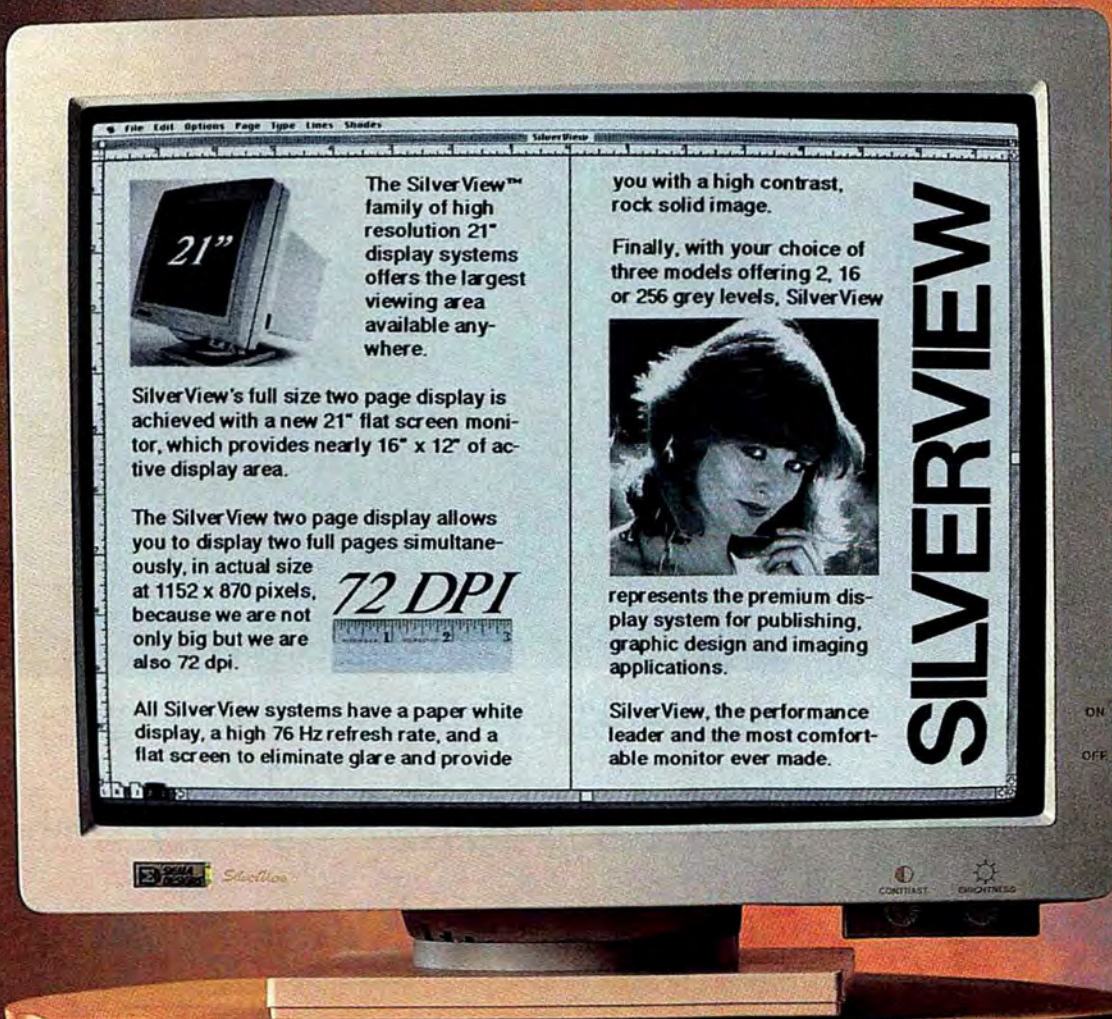
The gray scale.

Besides black and white, there are SilverView models offering 16 or all 256 different shades of gray. So what you used to leave up to the imagination can now be in all your work. Like subtle halftones or delicate shadings.

SilverView's also remarkably comfortable to work with. Its high contrast flat-screen virtually eliminates glare and distortion. And its unusually high refresh rate delivers rock solid images that never flicker.

To find out just how much better your work can look, call Sigma Designs at (415) 770-0100 today.

Then never scale down your ideas.



Sigma Designs, Inc.
46501 Landing Parkway
Fremont, CA 94538

PageView, SilverView and ColorMAX are trademarks of Sigma Designs, Inc.
MAC SE and Mac II are registered trademarks of Apple Computer, Inc.
Please circle 149 on reader service card.

Better is

The new 16" MultiSync® 4D and 20" 5D both offer compatibility with
a wide range of graphics boards and computer systems.

*NEC's award-winning
multiple frequency
technology, now available
in larger, digitally
controlled, high-resolution
color monitors.*



Both are optimized for the IBM PS/2, PC/AT/XT (and 100% compat-
ibles) and the Macintosh II. Both offer a microprocessor-based digital
control system for preset and custom graphics modes, automatic screen

MultiSync is a registered trademark of NEC Home Electronics (USA) Inc.

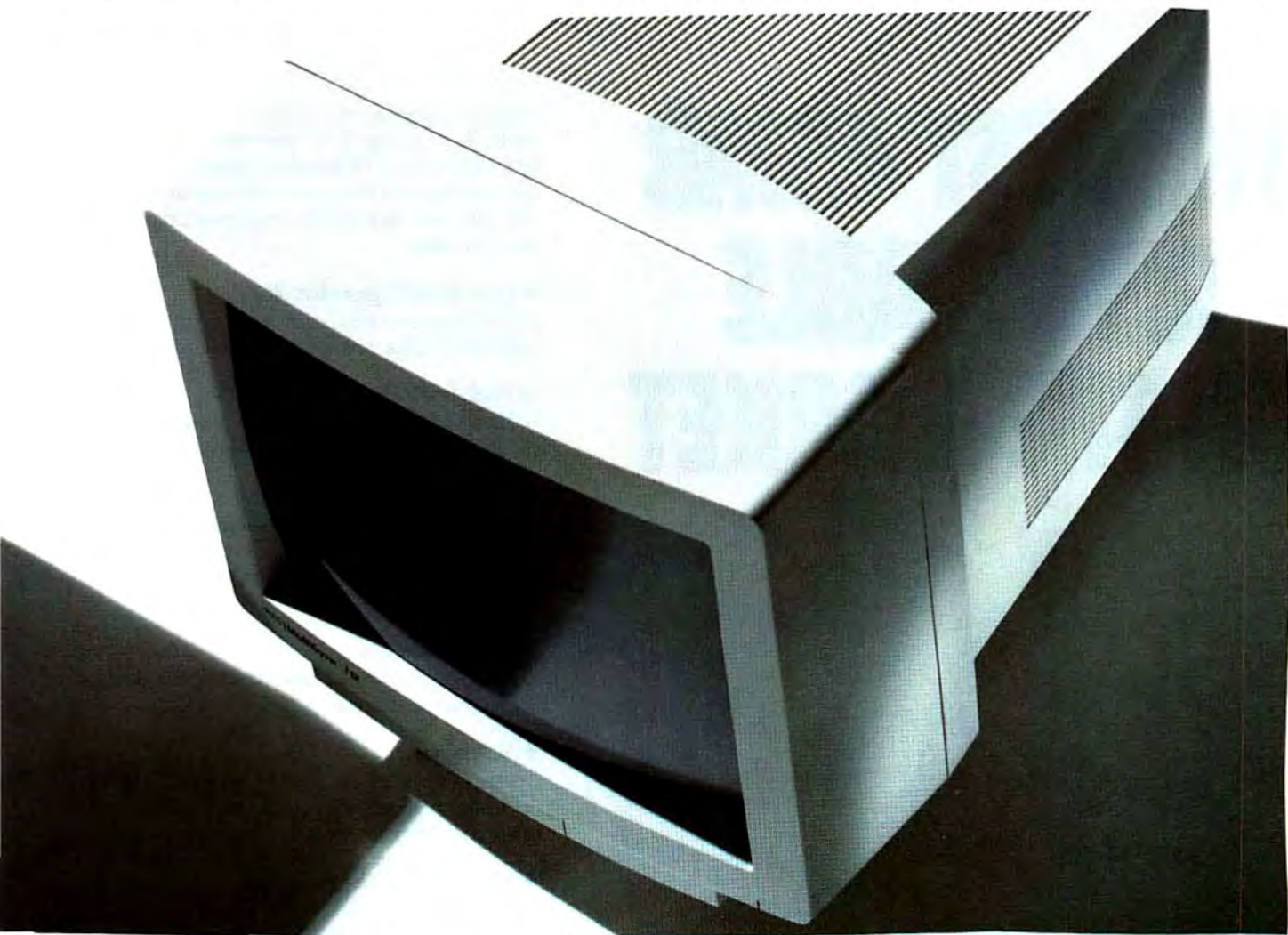


Computers and Communications

bigger.

configuration and optimal image. And both give you great resolution—

the 4D, from VGA up to 1024 x 768; the 5D, from VGA to 1280 x 1024.



The main difference: one is for large ideas. The other, for extra-

IBM PC/AT XT and PS/2 are registered trademarks of the International Business Machines Corporation.

large. For literature, call 1-800-826-2255. For details, call NEC Home

MAC II is a registered trademark of Apple Computer, Inc.

Electronics (USA) Inc. 1-800-FONE-NEC.

©1989 NEC Home Electronics (USA) Inc.

Please circle 166 on reader service card.

NEC



THE BEST 45MB REMOVABLE ON THE MARKET



IS ALSO YOUR BEST VALUE IN A HARD DRIVE.

DataPak – voted by you and industry experts as the hands down winner for the best new storage system for the Macintosh. With today's large applications and massive data files you need a system that grows with you, and megabyte for megabyte DataPak is your best value.

◆ Low-Cost Expandability

45Megabytes on a removable cartridge. Just pop in another cartridge whenever you need more storage.

◆ High Performance

The DataPak is actually faster than many fixed drives with its 25ms access time and 1:1 interleave.

◆ Portability and Security

PadLok software provides password protection and volume partitioning. And because DataPak cartridges are removable you can take them with you, or lock them up for ultimate security.

◆ Easy Backups

Our KopyKat software makes the DataPak ideal for backing up all your files.

◆ Selection

Choose a DataPak, DataPak II or the new DataPak IIcx to match your system. All are available in single drive, dual drive, or combined with a fixed hard drive.

◆ Award-Winning Quality

With all these features it's no wonder that DataPak is the only product of its kind to win three awards for outstanding quality and performance.

"Best New Storage System" - MacUser

"Best Alternative Storage System" - MacWorld

"Best New Hardware Peripheral" - MacUser Europe

The DataPak family – all the convenience of a floppy, all the performance of a hard drive.

Call **1-800-522-7979** for the dealer nearest you.



Please circle 122 on reader service card.

DataPak, DataPak II, DataPak IIcx, PadLok, KopyKat and MASS Microsystems are trademarks of MASS Microsystems, Inc. 550 Del Rey Avenue, Sunnyvale, CA 94086. Macintosh is a registered trademark of Apple Computer, Inc.

PINSTRIPE MAC



In the beginning, there was Multiplan. And it was good. In retrospect, it was not great, but it was the first spreadsheet with a graphical interface, and it was absolutely lyrical when compared with the command-line interface of Lotus 1-2-3 on the IBM PC. You did need a separate application, Chart, to draw graphs, and there were many things 1-2-3 did that Multiplan couldn't quite match, but there was a lot of magic in that first point-and-click spreadsheet. In its defense, Multiplan ran on a Mac 128K, so there really wasn't room for a fistful of features. But Multiplan was only a prelude.

It was in 1985 that the real action began. Lotus, publisher of

blow to Jazz. Microsoft even released a PC version of Excel to take on 1-2-3.

Things remained pretty much the same into 1987, when stories began circulating about Galaxy, the code name for Lotus' follow-up to the ill-fated Jazz. Galaxy was an improvement on Jazz in every way and even offered macros — and not just in the spreadsheet module. Meanwhile, Excel was more than two years old and getting long in

the tooth, without even a substantial upgrade to invigorate it. Lotus was on the comeback trail. There were some stumbles, such as when Lotus, feeling defensive about Excel for the PC, struck back by announcing its "intention to announce" 1-2-3 for

Spreadsheet Wars

the MS-DOS spreadsheet standard, 1-2-3, finally released Jazz amid much hoopla. Jazz wasn't just a spreadsheet; it was a word processor, a telecommunications program, and a database. Jazz had one of the best features in a Macintosh program so far: "hot views" that allowed instantaneous updates across different Jazz modules.

Jazz was also a flop. It might have been a success but for two things: Lotus didn't understand that the consistent Mac interface obviated much of the need for integrated programs, and Microsoft cut it off at the knees.

Back in January 1984 at the Macintosh introduction, Mitch Kapor of Lotus, Bill Gates of Microsoft, and Fred Gibbons of Software Publishing stood alongside Steve Jobs to show the world that "the big boys" of software development were supporting the Macintosh. Microsoft had one product, Multiplan, ready to go, with another, Word, to follow shortly. Lotus had only promises. Just over a year later, right before the release of Jazz, Microsoft pulled off the surprise of the decade by releasing Excel, a stunning spreadsheet program with integrated charting and database functions and, most important, a macro facility. No one had expected Microsoft to release another spreadsheet product when Multiplan and Chart were hardly a year old. And as reviewers and users started looking at Excel, they discovered that it didn't just beat Jazz and Multiplan, it also walloped Lotus 1-2-3 in features, ease of learning, and ease of use. Microsoft had seriously raised the ante in the spreadsheet game. Lotus was left with a poor cousin to its PC product, Symphony, while Microsoft had a serious competitor to 1-2-3. Excel was so good that it achieved the ultimate accolade: People bought Macintoshes just to be able to use it.

It didn't take long for Excel to establish itself as the standard for Macintosh spreadsheets. And in 1986, Microsoft debuted its integrated product, Works, which sold well and dealt the final

the Macintosh. All in all, as development on Galaxy progressed, Lotus was looking serious about the Macintosh market again. In January 1988, Lotus unveiled Modern Jazz, the near-final form of Galaxy, and it was still an impressive product. Several months later, when Modern Jazz was nearly ready for release, Lotus mysteriously killed the project, ostensibly to focus its efforts on 1-2-3 for the Macintosh (which, as of this writing, still has not been announced).

Lotus' sudden withdrawal from the field did not leave Microsoft free and clear. There were two more giants who wanted to play. The biggest (and first) splash was made by Informix, an IBM PC developer whose Wingz spreadsheet was announced with much fanfare at the beginning of 1988. Leonard Nimoy was the host of a special film shown in the Wingz "time shuttle" booth at the San Francisco Macworld Expo. The time shuttle was set to look ahead a few months but ended up looking forward more than a year, as Wingz suffered repeated delays. In the meantime, Ashton-Tate much more quietly debuted and shipped Full Impact, an excellent spreadsheet program from Randy Wigginton and Encore Systems,

There's one sure winner of the spreadsheet wars: the user. If none meets your needs now, just wait for a revision or two.



BY ROBERT R. WIGGINS

Write from the Start!



[Order Code 86-96957]

WORKING WITH WORD, 2nd ed.

Chris Kinata and Gordon McComb

Updated for version 4, this information-packed resource is filled with inside advice, information, and tutorials on Microsoft Word. Included are tips -- many not in the documentation -- that show you how to: desktop publish ■ integrate graphics ■ customize menus ■ work with lists, tables, and columns ■ retrieve lost files ■ optimize memory management ■ and much more. Plus blueprints for newsletters, multicolumn brochures, correspondence, and reports. **\$21.95**

QUICK REFERENCE GUIDE TO MICROSOFT WORD FOR THE APPLE MACINTOSH

Lisa Ann Jacobs

A handy action-oriented reference. Look up specific tasks without knowing Word commands. Great for instant answers to your Word questions.

\$5.95

[Order Code 86-97146]



Microsoft® Press

Computer Books That Make Sense

Available wherever books and software are sold.
Or call in your credit card order (800-638-3030). Refer to ad MU989.

Please circle 90 on reader service card.

PINSTRIP

developers of the original MacWrite.

By the beginning of 1989, things were looking bad for poor old Excel. Here was Full Impact and at long last Wingz, both with strong feature lists and big advertising budgets. Sure, Excel had finally gotten a modest upgrade to version 1.5, but the new kids on the block were both capable of much more attractive output. But once again Microsoft proved that you can't count it out and announced version 2.2 of Excel for the Macintosh. Version 2.2 finally broke the 1-megabyte barrier and added most of the kinds of features with which the competition had leapfrogged Excel, such as multiple-font support, variable row height, color, search/replace, and word wrapping. In one fell swoop, Excel was back in the game.


There's one sure winner of the spreadsheet wars, though: the spreadsheet user. No matter what you require in a spreadsheet, odds are one of them meets your needs. (See "Fitted Sheets," April '89, and "Wingz Weighs In," June '89, for more details.) And if none of them meets your precise needs right now, just wait for a revision or two. The fight has only just begun.

PINSTRIP PICKS

Many spreadsheet add-ons are available for specialized tasks. Contact the companies below (particularly Heizer Software Exchange, which has a large catalog) for their other offerings. Most of these add-ons are SYLK-compatible and should work with most major spreadsheets, but they all work with Excel.

Crystal Ball (Market Engineering). Forecasting and risk management that applies Monte Carlo-simulation techniques to models that you build with Excel, Works, or Multiplan.

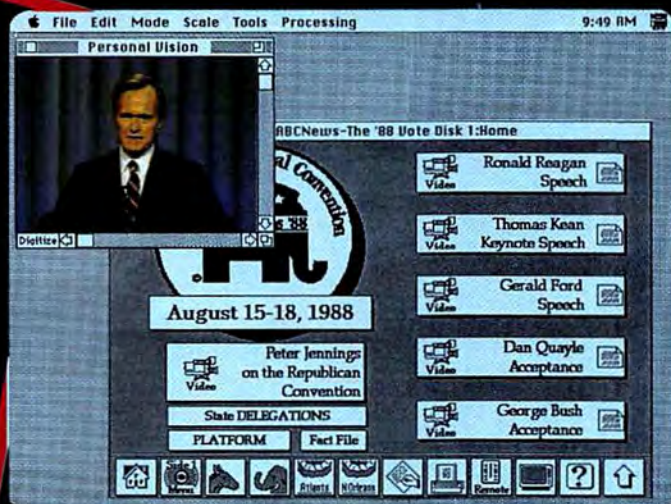
Best Answer (Heizer). Linear programming made easy. Excellent for optimization work with up to 250 variables. Comes with six good examples.

Business Plan Toolkit (Palo Alto Software). A complete guide to writing a business plan with all the spreadsheet files you need for financial and market analysis, including charts. 

Live color images can be displayed, captured, and enhanced from any video source including camcorders, VCRs and laser disks.

Personal Vision™

DESKTOP VIDEO PRESENTATIONS



Imagine importing live video from a variety of sources directly into a window on your Macintosh II. Personal Vision™, the new video digitizer card also known as PV™, integrates video with the text and graphics of your favorite desktop publishing or presentation program. The "film clip" can also be interactive video managed through an expanded HyperCard™ or SuperCard™ stack.

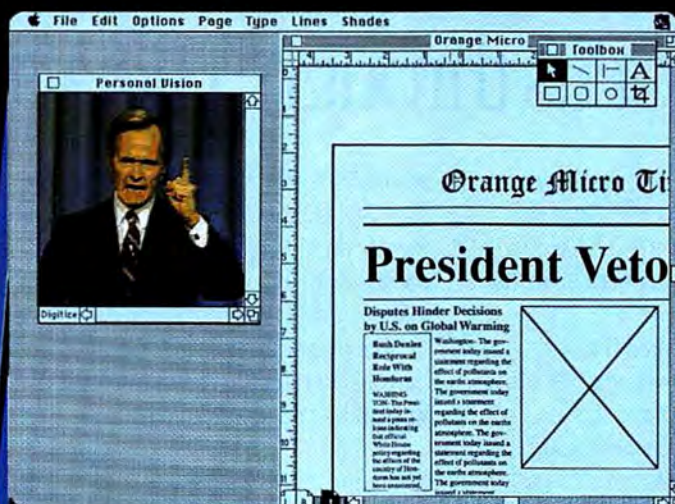
No longer limited by two dimensional computer graphics, PV brings vision to your presentations. For publishing applications, you can run PV in a window under MultiFinder™ and capture an image from your video source, digitize it, save it in any of eight standard file formats, or copy and paste it directly into PageMaker™, PowerPoint™ or your favorite program.

Typical applications for PV include: Multimedia training and education, security and personnel, video databases, desktop presentations and publishing, computerized video catalogs, and entertainment.

DEVELOPERS! "Inside Personal Vision" developer tools are available now. Built-in hooks, documentation and examples will let you access Personal Vision video directly from within your programs. Call today for more information.

Personal Vision™

FRAME GRABBING FOR DESKTOP PUBLISHING



The '88 Vote is a product of ABC News Interactive™ available from Optical Data Corp. Images were produced using Lasergraphics™ LFR™ film recorder. Personal Vision and PV, Apple, Macintosh, Mac, HyperCard and MultiFinder, PageMaker, SuperCard and PowerPoint are trademarks or registered trademarks of Orange Micro, Inc., Apple Computer Inc., Aldus Corporation, Silicon Beach Inc., and Microsoft Corporation, respectively.



Please circle 155 on reader service card.

Send now for your free
Introduction to Macintosh Video

Personal Vision™



© Orange Micro, Inc., 1989

Please send my copy of Introduction to Macintosh Video.

Name _____ City _____
Company _____ State _____ Zip _____
Address _____



1400 N. Lakeview Ave., Anaheim, CA 92807
(800) 223-8029, In CA (714) 779-2772



Michael Backes, film industry computer systems consultant, and Van Ling, creative and technical assistant to James Cameron, director of the new 20th Century Fox film The Abyss.

“We put the Jasmine DirectDrive through hell, but it got us through ‘The Abyss.’”

“Fifteen months ago, we started working on a new underwater adventure movie called *The Abyss*. We needed a hard drive that could stand up to the worst possible circumstances. So we got two Jasmine DirectDrives.” And immediately, we put them in the worst possible circumstances.

“We took them down to a hot, dusty place called Gaffney, South Carolina, where the majority of the film was shot. We put them in dirty rooms. We ran them almost 24 hours a day for over a year. They were dropped, they were covered with dust, they were bounced from location to location, they were used and abused—and they still worked great. We put them through as much hell as *we* went through. If anybody could break a drive, we could, and we didn’t. They really performed for us.

“Often, we wouldn’t have time to back everything up, so we just had to rely on the Jasmine drives to run properly all the time. And, even when they were really put through the ringer and we thought we were going to lose everything, the Symantec™ Utilities for Macintosh that come with the drives really saved us.

“We basically had the entire movie on those Jasmine drives. They were used to store storyboard scans, script changes,

animation tests, and various files covering every aspect of the film. This took up hundreds of megabytes of disk space, because the storyboards that we scanned into our Macintoshes® were constantly being revised and updated, and we couldn’t afford to throw anything away during filming.

“The drives are still working great. We figure they’ll probably have a long career in this business! And because they held up so well under pressure, so did we.”

 **Jasmine**
1-800-347-3228





MAINSTREAM MAC

WriteNow 2.0's speed is particularly impressive. On any given system — and I've used it on a Mac

512KE, a Mac Plus, a Mac II, and (briefly) a Mac IIcx — it's the fastest Macintosh word processor I've ever seen. For writers, especially — people who prize word processors that get out of the way when you're trying to think and want to dump the results of that thinking onto paper as fast as possible — WriteNow 2.0 is the Mac word-processing product of choice.

In fact, it may prove to be the word-processing product of choice for the majority of Mac users. It's not a do-everything program, but it's a do-everything-you-need-100-percent-of-the-time program for maybe 90 percent of us. (Note how that differs from the usual situation: programs that can do 90 percent of what you need 90 percent of the time. What are you supposed to do for that other 10 percent you need, often so badly, 10 percent of the time?)

What don't I like about WriteNow 2.0? Setting margins is

The Best Program I've Ever Used

I want to tell you about the best program I've ever used. It's . . . either WriteNow 2.0 or Microsoft Word 4.0.

Who says columnists aren't decisive?

I've been working with the new generation of Mac word processors for about a year and a half. If that seems like a long time to work with a new set of products before writing about them, remember the labor pains that attended the birth of FullWrite and a few other entries.

I'm glad it took so long, because it kept me from falling too soon for several products whose appeal proved transient. I was looking for something of — in Larry McMurtry's phrase — “permanent interest.”

I've used the Mac version of Word for a few hundred years now, like much of the rest of the Mac community. I've tried nearly every other word processor that came along, but none had the features and finesse I found in Word — or, at least, that I had beaten into Word when I finished modifying my copy.

FullWrite was my most passionate dalliance. It could do so many things I'd wanted for so long that I was sure I could overlook its shortcomings — but I couldn't. And MindWrite was a highly seductive, exotic flirtation along the way. But in the end it also had too many holes.

So I was primed for WriteNow 2.0. I'd long since given up on the first release of WriteNow. It had good ideas but didn't carry them out very well. WriteNow wasn't a very *serious* word processor, I thought.

A few weeks after I started using WriteNow 2.0 full-time — I test things by using them flat-out for my own work — I started telling friends I thought it might be The Best Program I'd Ever Used (TBPIEU). On any computer. It's fast. It's intuitive, mainly. It has nifty features. It imports and exports the right stuff.

infuriating, especially top and bottom margins. It'll drive you crazy until you figure it out — and then irritate the hell out of you every time you change margins. And the spelling checker is *counter-intuitive*: The way you invoke and use it is goofy.

Still, I thought WriteNow came closer than any program I'd used before to achieving that title of TBPIEU. I abandoned Word 3.02 for WriteNow 2.0. My work went faster. I was a happy man.

Then came Word 4.0.

I have a long-standing love/hate affair with Word. First, because as an early user of Word on the PC, I was disappointed that Microsoft's first release of Word for the Mac was so feeble. Second, because of the endless wait for the major upgrade that was finally called, oddly, 3.0. (Where 2.0 went remains one of the mysteries of the ages.) Third, because of all the bugs in the release version of 3.0, which were well documented in these pages. And fourth, because Word has always been so full of potential — but largely unfulfilled potential. (As Charlie Brown once observed to Linus, “There is no heavier burden than a great potential.”) But Word 4.0 — friends, Microsoft has finally gotten its act together.

I admire the lean grace and intuitiveness of WriteNow, but I sometimes need the muscle of Word.



BY JIM SEYMOUR

EVERYONE GETS FRONT ROW CENTER WITH PC VIEWER.™



Project your Mac® or Mac II® information onto a wall or screen with a PC VIEWER LCD projection panel and an overhead projector. To find out how you can be sure that everyone gets a clear view of your next presentation, call for a free detailed brochure and the dealer nearest you.

IN FOCUS SYSTEMS INC.

1-800-327-7231

PC VIEWER and Memory Module are trademarks of In Focus Systems, Inc. Mac and Mac II are registered trademarks of Apple Computer, Inc.

Please circle 14 on reader service card.

Spend a Week & Master the Mac!

Attend one of MacWorkshops 20 one-week sessions for creative professionals. Study with leading artists and experts, using the latest systems, in a delightful setting on the coast of Maine. Weekend sessions also offered.

Graphic Design	Advertising Production
Computer Animation	Corporate Communications
Illustration	AV Presentations
Film & Video Editing	Publication Design
Computer Photography	Composing for Film
Systems Design	Multi-Media Design

For 17 years we have been a leader in training programs for creative professionals in film, video, photography and design.

Write or Call for our Latest Catalogue

MACWORKSHOPS • Rockport, Maine 04856
Phone 207-236-8581 • FAX 207-236-2558

**MAC Training Creative Professionals
In the Macintosh Environment
WORKSHOPS**

Please circle 57 on reader service card.

MAINSTREAM

I first saw Word 4.0 about a year ago, in a hush-hush, work-in-progress demo. I was skeptical of the value of some of the big changes.

One change I profoundly misunderstood at first was Word 4.0's new Table feature for multicolumn text. I saw it as an OK but unimportant way of handling spreadsheetlike data in a text document. Oh, was I wrong.

By setting up a table and formatting the cells properly, you gain from Word the most marvelous way I've ever seen on a computer of jumping back and forth between text entries in multiple columns. Text wraps within each "cell" of each line of the table. How many times have you tried to do that manually, using carriage returns — and screaming?

As with every other high-end word processor, Word 4.0 has pushed into turf traditionally held by desktop-publishing programs. But Word's Table feature goes way beyond what you can do in any existing DTP package; it's a completely new *kind* of text-handling feature — and it's a doozy.

But Word's Achilles' heel remains speed: It's *much* slower than WriteNow 2.0, and in Page View mode it's slower than any other major word-processing program I've used on the Mac. But the overall richness of the program leads me to overlook that failing.

These two programs have pushed into a tie for that elusive TBPIEU title. Not just among all Mac programs or all text processors, but among all computer programs, period. While I admire the lean grace and intuitiveness of WriteNow, I sometimes need the muscle and genius of Word. I know no better example than this duo of the emerging split in the software market between fast, easy, do-almost-everything programs for the majority of users and monster-feature programs for power users.

I suspect I'm not going to be alone in keeping *both* of these programs on my hard disk. [For two more views on these programs, see "War of the Words," July '89, and "Word Wrestlers," August '89, — Ed.]

Winner

1989
MacWorld
Magazine
World Class
Award

Colorful choice.

PixelPaint 2.0, the best value for your 8-bit color Macintosh.
Or PixelPaint Professional, the most powerful
graphics program for any color Mac.

The first. And still champion.

PixelPaint™ The first color paint program for the Macintosh.*

Now there are two new SuperMac™ color paint programs. For creating superior color graphics with ease. PixelPaint 2.0, to get the most out of your 8-bit color Mac.* And PixelPaint Professional™ for the highest quality graphics in 8, 16, 24 or 32-bit modes.

PixelPaint 2.0. Excellent performance. Excellent value.

PixelPaint 2.0 lets you work easily with tools you use every day—like pens, brushes, lines and shapes. And gives you versatile tools for precision work—like masks and a PANTONE® Color selector. You can even make your own color separations.

You'll get the most out of 256 colors on your 8-bit system. With tools like our PixelScan™ scanning utility. And advanced computer effects like dithering, for smooth blends of up to 256 colors.

PixelPaint Professional. Exceptional graphics on *any* color Mac.

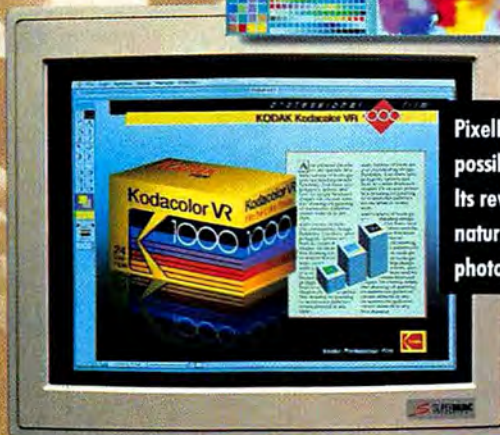
We've revolutionized the features we pioneered with PixelPaint. To take advantage of the millions of colors available in 16, 24, and 32-bit modes. And to dramatically improve how you work in 8-bit mode.

These new true color tools work easily and naturally. Mix colors on screen like paint on a canvas. Add transparent tints and shadows. And use real anti-aliasing for smooth shapes and blends. To create

photographic-quality images. For the first time on a personal computer.

Make the right choice.

PixelPaint 2.0 and PixelPaint Professional. See for yourself at your SuperMac software reseller. (And if you already own a color Macintosh paint program, ask us about our Software True Color TradeUp™ offer.) Then choose the one that's right for your business—and your budget.



PixelPaint Professional delivers the best possible graphics on any color Macintosh. Its revolutionary true color tools work naturally, to let you create and enhance photographic-quality images.

PixelPaint 2.0 gives you outstanding performance and value on your 8-bit, 256-color system. With easy-to-use tools, and a PANTONE selector for specifying industry-standard colors.



The first. And still champion.



485 Potrero Avenue, Dept. 300 • Sunnyvale, CA 94086
408 • 245 • 2202

Multiple choice.

SuperMac standard graphics subsystems. A complete family of graphics cards and monitors for your business and your budget.

The first. And still champion.

When Apple® introduced the first color Macintosh®, SuperMac™ was first with a large display. The SuperMac 19" color monitor, combined with our 8-bit Spectrum color graphics card, extended the performance of the new Mac®. And enabled new users to work more effectively with the sophisticated new wave of color software.

Today, SuperMac gives you even more ways to improve your work. With a new generation Spectrum/8™. And a complete family of color, grayscale, and monochrome subsystems. So you can choose the right graphics card and monitor for your work—and your budget.

And take full advantage of desktop publishing and presentation programs. Databases and spreadsheets. On *any* Macintosh II or SE system.

The Spectrum/8 (Series II) card for the Macintosh II. Get 256 colors or shades of gray on the most popular monitors. Including ours.

The Spectrum/8 supports all of Apple's standard graphics modes—1, 2, 4, and 8 bit. With up to 256 colors or shades of gray on a 1024 x 768 pixel display, the full area of SuperMac's 19" monitor. For sharp, brilliant images that look just the way they'll print.

And its unique Virtual Desktop™ gives you the same area on smaller monitors, like Apple's 13" color or 12" monochrome displays. Just move your mouse, and hardware pan allows you to instantly view any part of an

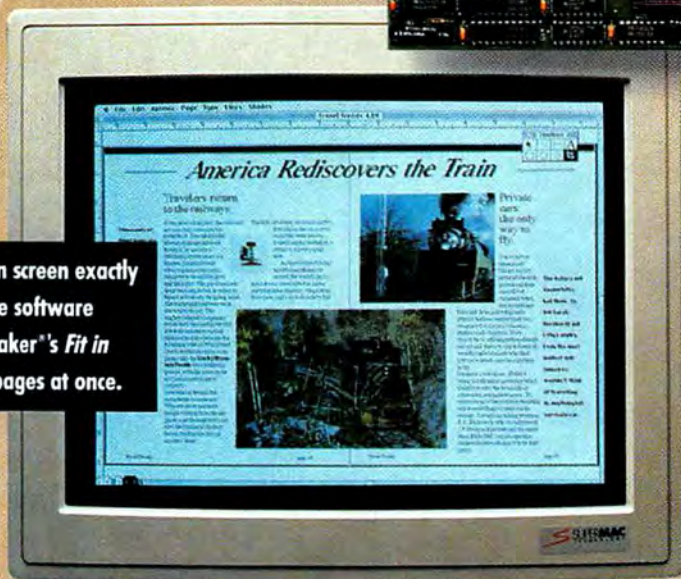
image that can't be displayed on screen at once. And hardware zoom gives you 2x magnification with a single keystroke.

And when 256 colors aren't essential, the Virtual Desktop lets you work in 2-, 4-, and 16-color modes. So you can reduce the number of colors on screen to enlarge your display up to 4096 x 1536 pixels.

The Spectrum/8 works with SuperMac's 16" and



See your document on screen exactly as it will print. Or, use software features—like PageMaker's *Fit in window*, to see two pages at once.



19" high-performance color monitors, based on Trinitron® technology. With our standard 19" color and grayscale displays. Plus Apple's 13" color and 12" monochrome monitors.

It's the only card that does it all. In color or grayscale. For large screens or small.

SuperView for the Macintosh II family and Macintosh SE. To make the biggest projects as simple as black and white.

Designed exclusively for our 19" monochrome monitor, SuperView™ provides a display nearly five times larger than the Macintosh SE's built-in screen.

So you'll have all your work, like large databases and spreadsheets, right before your eyes. Exactly like it will print.

And SuperView's new software provides dual-screen, zoom, and projection screen modes to help you get the most out of your SuperView/Mac SE monitor combination. Plus big cursors and menus, and a built-in screen saver to make small work of even your largest tasks.

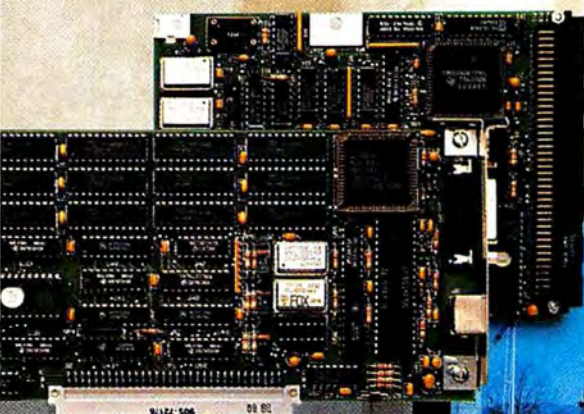
Spectrum/8. The only card that does it all. On most any color or grayscale monitor. The choice is yours.

Now there's a Spectrum/8 (Series II) designed just for the Mac SE/30.

We're first again. Supporting Apple's first compact color machine, with the Spectrum/8 for the Macintosh SE/30. Delivering the same high-performance capabilities we pioneered for the Macintosh II. Including the ability to support multifrequency monitors, and industry-standard NTSC monitors and projection equipment.

The choice is yours, at your authorized SuperMac dealer.

See your authorized SuperMac dealer today. And choose the SuperMac standard graphics subsystem that's right for your Mac, your business and your budget.



Use hardware pan to move instantly to any part of an image. Even if it doesn't fit on screen. And zoom to see your work at up to 2x magnification.

The first. And still champion.



485 Potrero Avenue • Sunnyvale, CA 94086
408 • 245 • 2202

WAS BUYING QUICKEN A HASTY DECISION?

A lot of people bought Quicken to help manage their finances. And a lot of people are perfectly satisfied with how far it takes them.

But if your idea of steering your financial future is more than just keeping your checkbook balanced, Quicken leaves you stranded. For serious financial management, you need Dollars and Sense.*

TURN BACK BEFORE IT'S TOO LATE.

Dollars and Sense goes far beyond mere checkbook balancing. It offers a full two years of record keeping data. The number of records is unlimited. It performs standard double-entry bookkeeping and automates record keeping. And, of course, it does virtually everything Quicken does. And does it better.

Quicken, on the other hand, doesn't know one year from another. And it keeps data in its own special format. So when you outgrow it, you can plan on junking all your old data—unless you buy Dollars and Sense. We include a new utility

to quickly import your Quicken files.

Perhaps, like a lot of financial program users, you're using Quicken to run a small business. That business is going to need a real double-entry accounting system if you're planning to make it a larger business in the future. Just ask your bookkeeper. Or your accountant.

Of course, we realize you thought you were getting all the horsepower you needed when you bought Quicken instead of Dollars and Sense. And maybe that's partly our fault for not driving home our benefits clearly enough. So we'd like to make it up to you.

IT'S QUICKEN FORGIVENESS TIME. TRADE UP TO DOLLARS AND SENSE NOW.

Now through the end of September 1989, we will give you full retail value when you trade in your original Quicken program disk (no copies), plus a discount on Dollars and Sense. Your net cost for Dollars and Sense is just \$49.95.

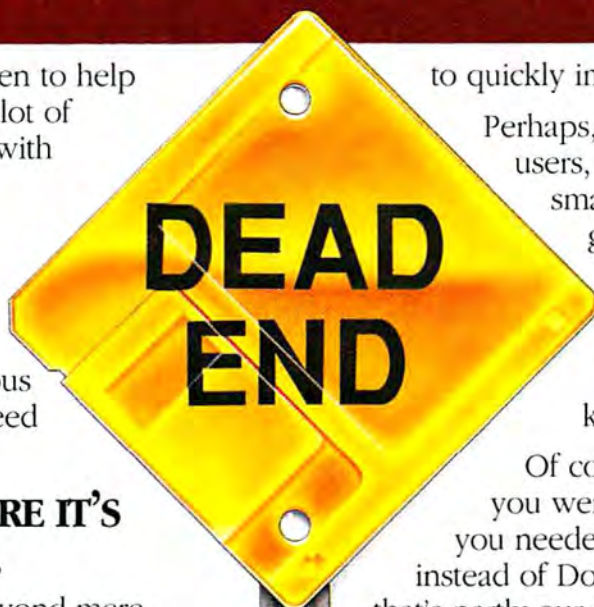
MONOGRAM®

531 Van Ness Ave., Torrance, CA 90501

(213) 533-5120

Details of offer: This offer is good only for purchases of Dollars and Sense direct from Monogram Software. To take advantage of this trade-in offer, send your original Quicken program disk and a check for \$49.95 plus \$5.00 shipping and handling, plus sales tax, if you're a California resident, to: Quicken Trade-in, P.O. Box 9047, Torrance, CA 90508, and we'll send you Dollars and Sense 4.2. Offer ends September 30, 1989. Quicken is a registered trademark of Intuit.

Please circle 100 on reader service card.



FEATURE COMPARISON

	Dollars and Sense	Quicken
Prints checks	Yes	Yes
Pays routine bills automatically	Yes	Yes
Helps you reconcile bank statements	Yes	Yes
Keeps track of income and expenses	Yes	Yes
Keeps track of assets and liabilities	Yes	No
Produces complete financial statements	Yes	No
Handles multiple checking, charge accounts	Yes	Not really
Years of data available in same file	2	1
Hierarchical accounts (i.e., sub-accounts)	Yes	No
Reports available in graphical format	Yes	No
Password security available	Yes	No
Easy to correct mistakes	Yes	No

When we decided to interview Guy Kawasaki about his new book, *The Macintosh Way* (Scott, Foresman and Co., \$19.95), I volunteered for the assignment immediately — in my usual low-key, genteel way. (Picture a grown woman jumping up and down with her hand in the air, chanting “I’ll do it! I’ll do it!”) As it turned out, I was a shoo-in — and I didn’t even have to hold my breath. I know Guy well, so I had a chance of getting away with sneaky questions; I’d read prepublication drafts of the book; and we both live in roughly the same neighborhood in Palo Alto (although not exactly on the same side of the tracks, metaphorically speaking).

This made it convenient to meet at one of Guy’s favorite restaurants,

Nice Guys Finish Books

Joanie’s (across the street from the legendary all-Mac ComputerWare store) for a Saturday breakfast-cum-chat for publication. (If you are unfamiliar with the ComputerWare legend — or Joanie’s — I can only refer you to Mr. Kawasaki’s book.)

For those among our readers who don’t know who Guy Kawasaki is — and welcome back; how was Arcturus? — he is one of the original Macintosh evangelists at Apple, which he left to start ACIUS, the company that publishes 4th Dimension. He’s also very funny, quite a good writer, and a hoot to interview. And he paid for breakfast.

EXERCISE #1:

Ask anyone from the Macintosh Division if they would do it all over again.

The Macintosh Way combines an insider’s account of the development of the Mac with a humorous and full discussion of a way of doing business that should probably be adopted across the board by the American business community. Don’t skip the footnotes or the exercises, either. The footnotes alone are worth the price of the book. Among my favorites are the ones for CompuServe,¹ Cray,² bug,³ and dating.⁴

¹CompuServe is an electronic bulletin board where people communicate with each other about meaningless topics all day and all night long. It is the closest thing to dating for a nerd.

²A Cray is a supercomputer. It costs about \$15 million. It comes bundled with engineers, it’s available in about 250 colors, and it can eat a Macintosh for breakfast. Apple bought a Cray to design the next Macintosh. Cray bought Macintoshes to design the next Cray.

³A bug is an imperfection in your competitor’s program. Imperfections in your programs are called various things depending on who you are: ACIUS — anomaly, Claris — unexpected result, Microsoft — wrongful termination, Apple — undocumented feature.

⁴Dating is when two people go someplace where there are no computers, talk about anything except computers, and do analog stuff afterward.

And now from the horse’s mouth: *I understand that MacUser in some way inspired you to write a book. How did we do that?*

I really enjoyed writing a guest column for *MacUser* [“How to Succeed in Mac Software,” September ’88], so I contacted *MacUser* to be a regular columnist. My next goal in life is to be the Fran Lebowitz of high technology. You guys blew me off, so I decided to write a book instead.

[Actually, that’s not exactly how we would describe it, but it is, after all, Guy’s interview.]

Why did you write this particular book?

I didn’t like how history was being recorded — particularly the interpretation of Steve Jobs’ role. Most of the current books about Apple and the Macintosh completely miss the point of what Steve and the Macintosh Division were trying to do.

Also, the revisionist historians were getting quite a few things wrong. For example, most of Apple fought against the LaserWriter. Apple Marketing just wanted a letter-quality printer driver, not a laser printer. Most of Apple fought against what saved it.

So what were Steve and the Macintosh Division actually trying to do?

We were trying to bring computers to more people to increase their creativity and productivity. It was a divine and grand mission. Seriously. There were a few screwups and tragedies along the way, but it was worth it nonetheless.

What would Apple be like today if it had continued to espouse the Macintosh Way?

Apple bashing, like oat bran, is “in” these days. One could say that Apple’s marketing consists of using “desktop” as an adjective, its product development of cutting out slots, and its support of telling people to go back to the dealer.

I believe Apple *has* continued to espouse the Macintosh Way — it’s just a lot more difficult when you’re a \$5 billion company with 10,000 employees. Apple can do the difficult quickly. The impossible takes a little longer. This answer has some oat bran in it, doesn’t it?

How would you characterize Apple’s present corporate style in a few well-chosen, witty words?

As Jean-Louis Gassée would say, “It could be even more stable at this time.”

Without the radical changes that took place in Apple’s corporate structure in 1985, what — if anything — would be different about the Macintosh itself?

It would probably be a black cube and not shipping. But as some

CONTROL PANEL



BY LOUISE KOHL

yuppie once said, "Individuals dwelling in glass domiciles should refrain from activating geological objects."

What would have happened if you had been given John Sculley's job?

Apple would have published 4th

Dimension and Jean-Louis would be wearing a hoop earring rather than a stud. I don't want John's job. I want to be the Fran Lebowitz of high technology. However, if I were president of Apple for one day, I would extend the warranty pe-

riod to one year and ban the printing of T-shirts, and put that money into telephone end-user support. As I say in the book, "I can't explain why a company that spends \$2 million on a Christmas party and \$2 1/2 million on T-shirts doesn't provide direct customer telephone support. Or hires only one summer student to fix ImageWriter drivers. Some things you simply accept, I guess."

In the book, you characterize Macintosh Way companies as wanting to change the world and selling a dream. How do you want to change the world?

I want to change the world just a little by helping people celebrate absurdities.

EXERCISE #2:

**Call Apple at
(408) 996-1010
and ask for technical
support.**

The dream I'm selling with 4th Dimension is the ability to control one's data and computer. If enough people buy that dream, I'll be able to buy my dream.

Speaking of dreams, when is the next version of 4D going to ship?

Oh, about the same time that your editors and columnists start returning my phone calls.

What companies are furthest down the Macintosh Way?

There's about a 2,000-way tie for last place in the software business. In business as a whole, Honda is the furthest along. They make their cars so good they don't require support — that's the best support of all. If I weren't so insecure, I would drive one. [Guy drives a Porsche with the license plate "MERC14D." Ah, well . . . if wishes were Porsches . . .]

Is NeXT a Macintosh Way company? Will the NeXT machine change the world? Is it a dream for sale (or at least lease)?

³NeXT is the computer company that Steve started after he was purged from Apple. Almost everyone (some secretly) hopes he succeeds. A few Apple employees have gone to NeXT to relive their youth. Some have returned to Apple because youth is overrated.

⁴A NeXT computer is the most indulgent computer you can buy today, especially if you have a burning desire to model bouncing balls.



Andrew Gault

Yesterday, this woman gained access to classified information.



This man learned the location of a bomb on Broadway.



And this woman had a rendezvous with a mysterious stranger.

A cunning spy? A SWAT team member? A passionate temptress? Only at first glance.

Take a closer look, and you'll find three people who have discovered the magic of *Aline*—the on-line meeting place that has the most fun and exciting services.

The woman who accessed "classified information" was checking her electronic mailbox—she was pleased to find many responses to the classified ad she placed last week.

The man who found the bomb on Broadway read a review of a forgettable new play in *Aline's* Entertainment Guide—and decided to see a recommended movie instead.

And the "seductress" in question met a great guy on *Club Aline*—they'll be meeting for drinks next week.

You can do all this—and much more. Just call *Aline* today and let the fantasy begin...

Make the Connection.



© 1989 Newcom Link, Inc.

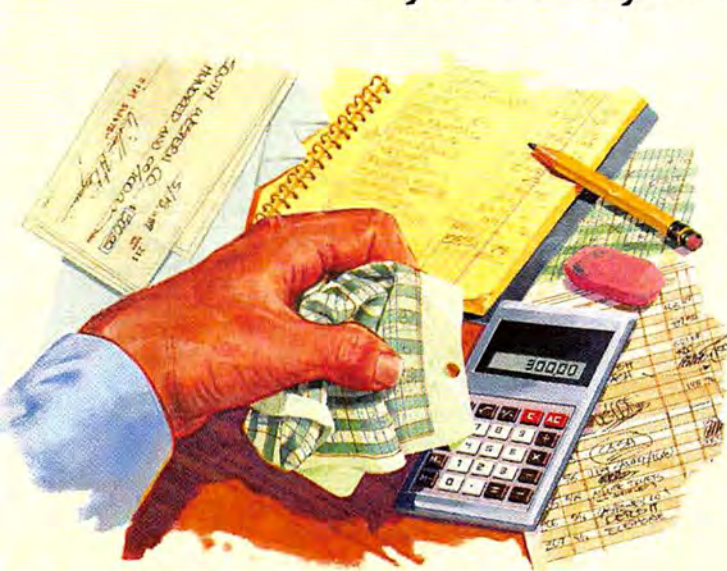
Set modem to 1200-N-8-1, dial '900' number & once connected press 'Return.' 45¢ for first min., 30¢ each add'l min. on your phone bill. For info call (212) 826-3894.

**NO REGISTRATION, CALL NOW!
1-900-468-8888**

Please circle 56 on reader service card.

Say Goodbye to Financial Hassle!

NEW
VERSION 1.5



So Long, Tedium

Why waste time doing your finances? Quicken slashes time and effort every month...perfectly organizes your finances...and provides instant insight into your money matters.

Breeze Through Financial Chores

Quicken takes the drudgery out of routine finances. It automates everything from bill paying to bookkeeping...reconciliation to reporting. Quicken does in minutes what used to take hours.

Quicken actually learns your regular bills. Just confirm payment amounts, and in seconds, Quicken performs 14 bookkeeping steps, categorizes expenses, and hands you printed checks addressed for mailing. And, Quicken keeps perfect records of all your handwritten checks.

A Bigger Picture with Smaller Effort

Quicken automatically organizes your finances. Imagine always knowing how much money you have...and exactly where it's going. At the click of a button, Quicken generates insightful reports such as Income and Expense, Cash Flow, Budget vs. Actual, Job Costing, and more.

Relax at Tax Time

Stop dreading tax time. Quicken keeps important tax data at your fingertips automatically. In seconds, you can print an itemized list supporting your deductions. Plus, Quicken links directly to top selling tax software like MacInTax.*

NEW VERSION 1.5 FAR MORE THAN A CHECKWRITER

- Far more flexible reports:
 - Multi-column reports show spending and profit trends over time
 - A/R aging and customer history reports
 - A/P reports by supplier
 - "Modeless" reports recalculate automatically on screen
 - Improved payroll handling
 - More ways to split transactions
 - New wallet-size and laser voucher checks
 - New Canadian dates and tax categories

The World's #1 Best Seller

Quicken is the best selling business and personal finance software in the world. Ken Landis of MacUser gives Quicken the



highest rating of five mice and says, "Quicken is a great program...the industry standard" Broadway playwright ("Mame") Robert E. Lee remarks, "This astonishingly simple program...is truly true to its name. Indeed, it does quicken the time required for routine bookkeeping."

No Computerease or Accounting Mumbo Jumbo

Quicken is so easy, you're up and running in minutes. That's because the whole program looks and works just like the paper checkbook and register you've always used. Quicken doesn't change how you do your finances, only how fast you finish them.

Powerful Business Features

Over half of Quicken's customers use it for small business bookkeeping. Quicken produces financial statements such as P&L, Tax Summary, and other useful management reports. It forecasts your cash flow, and tracks A/R, A/P, payroll, jobs, clients, properties, and more.

SPECIFICATIONS

Software Compatibility: Exports to SYLK, Text, Excel*, HyperCard*, and MacInTax.
Hardware Compatibility: All Macintoshes with at least 512K RAM. Works with your printer and monitor, we guarantee it. Capacity: Unlimited number of bank accounts and transactions (subject to available disk space). Maximum amounts to \$9,999,999.99.
Other: Unlimited FREE technical support. Not copy-protected. Checks are preapproved by all financial institutions in the U.S. and Canada. Sample checks and order form are enclosed in Quicken package. Also available for IBM and compatibles and Apple II (feature sets vary).

Quicken is available at most computer and software stores.



Hello, Quicken

Try Quicken FREE for 30 Days

Order from the coupon below, and if you're not completely satisfied for any reason, simply return it for a full, no-questions-asked refund. So, why wait? Say good riddance to financial hassle, and order Quicken today.

Send in the coupon, or call
1-800-624-8742 U.S. and Canada.

\$59⁹⁵



Yes, I want to say goodbye to financial hassle and try Quicken. If I'm not completely satisfied, I may return it within 30 days for a full refund. Quicken Version 1.5 for Macintosh, U.S. \$59.95, includes free shipping by air. California residents, please add sales tax. For coupon orders, allow 10 days for delivery (longer to Canada).

Name _____
Address _____
City _____ State _____ Zip _____
Daytime Phone (____) _____
Preferred payment method (check one)
☐ Check enclosed (no purchase orders or COD, please)
☐ Visa ☐ MasterCard ☐ American Express
Card No. _____ Exp. Date _____

Signature _____

Mail to:

Intuit
540 University Ave.
Palo Alto, CA 94301

Or, call: 1-800-624-8742 in U.S. and Canada for charge card orders.
Current Quicken users
To upgrade, call the 800 number above.

G-MU09

Diskette Labels for Laser Printers



Use Avery Laser Diskette Labels to customize your 3 1/2" & 5 1/4" diskettes from your HP, Apple and other popular desktop printers.

A special adhesive assures the labels won't peel off in your disk drive.

Ask for Avery Laser Printer Labels for 3 1/2" diskettes (product #5196) and 5 1/4" diskettes (product #5197) wherever computer and office supplies are sold. For a free sample pack, call 1-800-535-3232 ext 30.



Please circle 42 on reader service card.

I don't think Steve wants NeXT to be a Macintosh Way company. He wants to create the NeXT way — he's not into merely re-creating or repeating history. I have a rough idea of what the NeXT Way will be: Design a machine to kill Apple, position it for universities, give Businessland a one-year exclusive since you can't build enough anyway, then tell the world that "business [buyers] demanded that they buy our machine." There's a lot of oat bran in this one, too.

You slam Apple yourself in the book. Is this by any chance sour grapes?

Sour grapes for what? Apple was very, very good to me. I love Apple — that's why I slam it. A lot of Apple employees wish they could say what I said in the book. It's a testimony to Apple's humility and Jean-Louis' level of testosterone that he wrote the foreword.

One of the things you hit hardest is Apple's early association with Microsoft and Ashton-Tate. How would you have handled that situation?

Microsoft, or more accurately, Bill Gates, respects only power. When Gates builds a missile, you build a missile. Ashton-Tate, meanwhile, is investigating cold fusion. The only way to deal with both of them is to say, "Lead, follow, or get out of the way."

I take it that Jean-Louis Gassée read the chapter about himself. "BFD: Big French Deal." What was his reaction?

He edited the chapter to make it even better. It's his way of saying, "Here's the recipe. Here are the ingredients. Now, bozo, try to be a master chef." It's my favorite chapter.

Did you consider any other titles for the book?

The Reward is the Reward. Guyanetics. In Search of Mediocrity. Up the Status Quo. There were some pretty cerebral choices.

Did you learn anything by writing the book?

Yes. I had this concept that authors had all this wisdom stored in their brains, and all they had to do was vomit it onto the pages. It's not true. Writing forces you to think, rethink, and question all the things that you thought you knew.

I also learned a lot about product development. I thought I could finish the

book in two to three months in 100 pages. It took me roughly twice as long and twice as many pages. I thought I was feature-frozen many times, but I couldn't resist adding more things. I can relate a lot better to programmers now.

Why do you have a chapter about dating and marriage?

Why not? It's my book. It's a wink between myself and readers. I think that more people care about dating and marriage than about "SQL interoperability platform independence" — if you know what I mean.

[You may take it that I know what he means. I also recommend this particular chapter to every man in Silicon Valley who hasn't yet answered the question, "What do women want, anyway?"]

EXERCISE #3:

Send me [Guy] an EasyPlex on CompuServe. Ask me if Beth wants me off the computer.

Where did you learn to write so well and so funny?

First, I had a tweak English teacher in high school. He made us correct every error in our papers by citing the rule we violated, writing the sentence the wrong way, and then writing it the right way. Second, I am a voracious reader, so I get a lot of inspiration. Third, I had a good editor — Steve Roth. Fourth, I read your column. The oat bran is getting overwhelming now.

So why isn't my name in the book anywhere?

Neither is Jerry Borrell's. I kept both of you out so you could both write about the book in your columns. It seems to have worked well.

[Interview concludes as we negotiate for the second edition.]

CONTROL

Mac to any Fax



Now you can treat any Group III fax machine in the world as a remote printer for your Mac. With the Abaton InterFax™, you can print letters, reports, and memos in Los Angeles, New York, London, and Tokyo, even if your office is in Peoria.

And all your documents will look as good off the fax as they would off an ImageWriter. No blotchy letters, streaky lines, or dirty smudges like normal faxes. With the Abaton InterFax, even your fine print is perfectly legible.

And the InterFax gets your fax out fast. *MacWEEK* rated it the fastest fax for the Mac. That's because the friendly InterFax software compresses your file first, then sends it out. So it takes less time to transmit.

You can also use the InterFax as a Hayes-compatible data modem to communicate with other asynchronous devices. Which makes it a great deal as well as a great tool. But that's not the only way it saves you money. With the InterFax, you can schedule when faxes are

sent—like right before a telephone conference, or after hours when the rates are lower. And because the InterFax receives as well as it sends, you can screen faxes before you commit them to paper.

Since the InterFax works in background—with or without Multifinder—you can continue working in PageMaker, Excel, Word, or most other Macintosh applications while you're sending or receiving faxes. Which makes you even more productive.

If you want to know why *The Macintosh Buyer's Guide* rated the InterFax 9.3 (out of a possible 10), call Abaton at 1-800-444-5321. We'll fax or mail you more facts about the InterFax. Then you can start faxing (and printing) all over the world.



Abaton

We Make Your Ideas Easier to Publish™

Abaton is a subsidiary of Everex Systems, Inc. Abaton, InterFax, and "We Make Your Ideas Easier to Publish" are trademarks of Everex Systems, Inc. Other brand names and product names are trademarks or registered trademarks of their respective companies. Earth photo courtesy of NASA.

Please circle 66 on reader service card.

START UP

Welcome to StartUp, our first words on the latest news and products. We'll also be keeping our eyes on trends, what's happening in the world of graphical user interfaces, what's in beta, and a lot more. In our premier edition, you'll find reviews of Omnis 5, Excel 2.2, Business Sense, SmartForm, and more. Plus, we'll take a first peek at PixelPaint Professional, TurboStar, and CanOpener.

CONTENTS

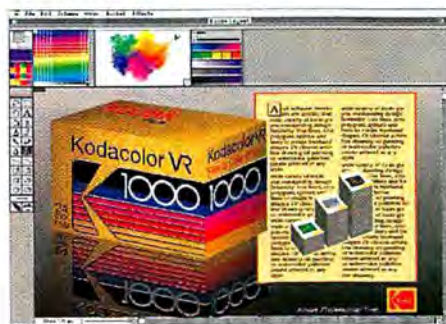
Microsoft	
Excel 2.2	60
Omnis 5	61
Table Tools	62
Business Sense	67
SmartForm	
Designer	68
XTreeMac	78
MultiClip	82
Voyager	89

Edited by Russell Ito

PixelPaint Turns Pro

SuperMac has pumped up PixelPaint into PixelPaint Professional. Its 32-bit color choices are essentially limitless, and effects that would be impossible with 8-bit color are simply a stroke or two away. The familiar PixelPaint interface remains uncluttered.

With the subtleties of 32-bit color, PixelPaint Pro offers natural blending effects, anti-



aliased (jaggy-free) lines and text, a realistic airbrush, transparency, and tools that blend and smear. One powerful touch is the ability to have the blend tool follow the path of a line, curve, or polygon automatically. PixelPaint Pro can mask (protect from change) selected areas, newly typed text, or a range of colors. It can merge another document into an open paint file as ordinary drop-in art or as a variable transparency.

PixelPaint Pro works in 8-, 16-, 24-, and 32-bit color modes and runs on all Mac IIs and SE 30s. In 16-, 24-, and 32-bit modes, PixelPaint Pro requires 4 megabytes of RAM. MacPaint, PICT, PICT2, EPSF, and TIFF formats are supported. PixelPaint Pro outputs to QuickDraw and PostScript printers, and it offers built-in color separation and halftone controls.

If you can't afford—or don't need—32-bit color, the 8-bit version of PixelPaint will still be available. — Salvatore Parascandolo

● SuperMac Technology, 485 Potrero Ave.
Sunnyvale, CA 94086; (415) 349-8400
\$699

Database Cause and Effect

As more PCs and Macs begin living together, database-management applications that work on both platforms are becoming more desirable. The duo of Cause and Effect, from Maxem, uses a simple graphical interface on both machines, and it may be a solution for users who need custom databases but don't want to hire professional programmers.

Cause and Effect are a little like HyperCard: Small windows with a little house icon that brings you back to the first card pop up on the screen. Unlike HyperCard, Cause produces relational database systems. Another difference is that two programs are required: Cause generates, compiles, and modifies applications, and Effect runs the applications. A feature that promises to be popular with developers is that Cause automatically generates user documentation for applications.

Cause doesn't use a traditional programming language; a series of decisions is made with menu choices and fill-in windows. Maxem has promised a subroutine language and commands to call other languages, similar to HyperCard's XCMDs, by the end of 1989.

When an application is created, two files are generated, the source and the run-time. Double-clicking on the run-time file brings up the application (using Effect), and clicking on the source file brings up the modifying environment (using Cause), which is required to modify anything. To move applications between DOS and Mac environments, move the source file from one machine to the other and recompile it, using the native version of Cause. You may have to adjust some screens. — John Rizzo

● Maxem Corp., ASU Research Park, 7855 S. River Parkway, Suite 217, Tempe, AZ 85284
(602) 491-2466. Professional version with unlimited run-time license rights, \$595; personal version, \$495



An All-Purpose CanOpener

The only problem with the ever-growing number of Mac applications is that there's also an ever-growing number of proprietary formats. Invariably, you never have the application you need to open the document you want to view right *now*. That's where CanOpener comes in. This handy utility, which comes as both a DA and an application, lets you open and view almost any file.

CanOpener can open any type of text, EPSF, PICT, or paint file — even if it's contained within another file type — without requiring prior conversion. Other utilities have similar abilities, but they require the document to be saved in their own format first.

CanOpener performs free-text searches as well. While other utilities can also do this, CanOpener goes one step further. Since it can open practically any file type, it can find text strings even if they're in a graphic (provided they were created with a text tool). Unlike its competition, CanOpener lets you open and view entire documents without switching applications.

Currently, CanOpener's only limitation is that it can't properly display files created by programs that use floating-point calculations, such as spreadsheets. However, the publisher promises this feature will appear in the next version.

If you've been looking for the software equivalent of a skeleton key, CanOpener may be it. — Russell Ito

● Abbott Systems, 62 Mountain Road
Pleasantville, NY 10570; (800) 552-9157. \$125



CanOpener, available as both a DA and an application, can open almost any file format without conversion, and it also conducts



free-text searches. It was able to find this occurrence of the word *canopener* even though it was part of a graphic.

NewsLine

A MOLE IN THE APPLE?

CUPERTINO, CA — Apple's Macintosh source code has been one of the industry's most closely guarded secrets, but now someone is giving away pirated copies. A group calling itself the nuPrometheus League has distributed disks containing 1.4 megabytes of source code. This source code includes (in the group's words) "the complete assembly language source to both Color QuickDraw and all the hardware Equate files for the various Macintoshes [sic] ROMs," with more to follow.

The group says its goal is "to distribute everything that prevents other manufacturers from creating legal copies of the Macintosh. As an organization, the nuPrometheus League has no ambition beyond seeing the genius of a few Apple employees benefit the entire world, not just dissipated by Apple Corporate through litigation and ill will."

Apple has mounted an internal investigation and has assumed that the pirated code is genuine. Apple says that it considers the code to be stolen property and that it will prosecute anyone caught using or receiving the pirated material.

WHOSE NEXT?

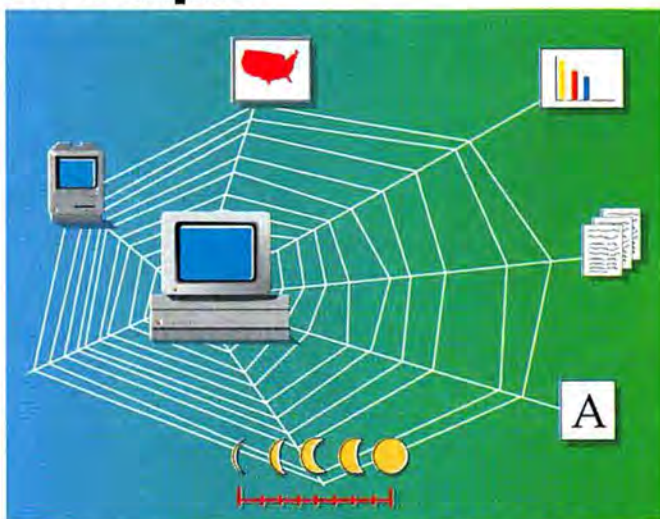
FREMONT, CA — Steve Jobs has signed a \$100-million investment deal between his company, NeXT, and Canon. Canon now owns 16.67 percent of NeXT, as well as the exclusive Asian distribution rights to the NeXT machine. Canon's future holdings cannot exceed 20 percent of NeXT for at least ten years, and no technology-licensing or manufacturing rights were granted.

Canon thus becomes the third-largest NeXT shareholder, after Jobs (50 percent) and NeXT employees (20 percent), and ahead of H. Ross Perot (12.5 percent) and Stanford and Carnegie-Mellon universities (.83 percent).

MICROSOFT OFFICE COMPACT DISC

REDMOND, WA — Microsoft, the first major software publisher to commit to using CD-ROM as a software-delivery medium, announced that its Microsoft Office bundle (which includes Word 4.0, Excel 2.2, PowerPoint 2.01, and Mail 1.37; see the review of Excel 2.2 in this issue for more details) will be available on CD-ROM. The CD-ROM version will list for \$899 — only \$50 more than the disk-based version — and will include all the documentation in HyperCard format on the disc. The multimedia documentation will include sequences created with Farallon Computing's ScreenRecorder and MacRecorder.

Big Media on Campus



Brown University's Institute for Research in Information and Scholarship (IRIS), in conjunction with the Apple Programmer's and Developer's Association (APDA), has taken hypermedia out of the academic hot-house and dropped it into developers' laps with the release of IRIS Intermedia, a multiuser development system. Using applications developed with IRIS Hypermedia, a network of Mac users can explore a shared database, creating and tracing individual paths and links.

Designed for network use under A/UX, IRIS Intermedia consists of two parts: the IRIS Intermedia Server, which contains the file system, database, and document links; and the Intermedia Client, which runs on the local stations. Intermedia Client comprises four applications: InterWord, a word processor; InterDraw, a graphics editor; InterPix, a scanned-image viewer; and InterVal, a time-line editor.

Designed for nonprogrammers, IRIS Intermedia uses the four applications plus menu commands to build webs of information. Each user creates webs by using the menu commands to link anything from single characters to entire documents. Multiple links between documents are supported, and all links are bidirectional. — Russell Ito

● APDA, 20525 Mariani Ave., Cupertino, CA 95014
(408) 996-1010. IRIS/Brown University, P.O. Box
1946, Providence, RI 02912; (401) 863-2001
\$150 (does not include A/UX)

With IRIS Intermedia, a network of users can create webs of information by linking anything from single characters to entire documents.

Nano, Nano?

The two most-common time values associated with computers are nanoseconds (ns) and milliseconds (ms), but many users may not know the difference. A nanosecond is a billionth of a second. A beam of light travels one foot in a nanosecond. A millisecond is a thousandth of a second, or one million nanoseconds. A beam of light travels 19 miles — or the length of Manhattan plus 6 miles — in one millisecond, but it can't even get down the block in one nanosecond.

A Network Star

For the first time in the AppleTalk world, network administrators will be able to access a star controller from any Mac on the network, even across bridges. Nuvotech's TurboStar is an intelligent star-controller and network-management package that gives network administrators more control over their problems.

TurboStar acts as the hub of the network, boosting incoming signals from up to 16 lines of networked Macs that form the star's "arms." Star configurations are popular with networks that use existing telephone wire, because no additional wiring is needed, and the controllers can be kept in telephone-wiring closets next to the patch panels. They also let you have longer networks than are possible with simple daisy chains.

An important feature of TurboStar is the ability to run live, on-line diagnostics for each arm of the star separately. For each port of the TurboStar, the software gives you a live graph of traffic in packets per second, error rates, and a list of nodes and node types. This data has been available before, but only for the network as a whole. — John Rizzo

● Nuvotech, 2015 Bridgeway, Suite 204
Sausalito, CA 94965; (415) 331-7815. \$1,795

MUG Shots

Mac User Group News

MUG OF THE MONTH: The NASA Headquarters MUG has produced an 18-minute VHS-video tutorial on how to detect and get rid of Macintosh viruses. The video is available for \$15 (or for \$20 as a set of eight disks — If you have a Mac II with 4 megabytes and VideoWorks Interactive).

SPEAKING OF VIRUSES, be sure to obtain a free copy of Virus Encyclopedia, a stack by Henry C. Schmitt. This stack, combined with the NASA tutorial, thoroughly covers the virus issue. The Virus Encyclopedia is available on most BBSs. NASA Headquarters MUG, Dave Lavery, NASA Headquarters, Code RC, Washington, DC 20546. Henry C. Schmitt, 6613 Scott Lane, #17, Hanover Park, IL 60103.

Don Rittner is editor of the MUG News Service. Send him MUG news at GEnie: D.RITTNER; APPLELINK: UG0194; or APPLELINK PE: DRITTNER.

Topping TOPS

There's a new distributed-file-transfer program that's the first direct challenger to TOPS, and it has a lot going for it. Like TOPS, Personal Server Network (PSN), from Information Presentation Technologies (IPT), passes files among computers without a dedicated file server.

Unlike TOPS, PSN is compliant with the Apple Filing Protocol (AFP), and the user interface looks exactly like AppleShare. From the Chooser, users can pick PSN published volumes as well as disks on AppleShare and other AFP servers. PSN uses AppleShare's scheme for passwords and file-access privileges. Published volumes appear on the desktop in the same way that local disks do.

PSN works with Macs, PCs, and UNIX machines that use IPT's uShare AFP server software. This capability allows a Mac network to start small and grow later, when it's connected to a bigger system. For example, a PSN network connected to a UNIX computer can take advantage of the large storage capabilities of UNIX machines. So users who want their local disks backed up can publish their disks at the end of the day, and a UNIX machine can automatically back them up at a convenient time, such as 2 A.M. — **John Rizzo**

● Information Presentation Technologies
23801 Calabasas Road, Suite 208, Calabasas, CA
91302; (818) 347-7791. \$149 per node



Seeking Access

Many people think access time and seek time are the same thing. Wrong. Access time is the total time it takes for a storage device, such as a hard drive, to find a given piece of data. Seek time is the time it takes to send the head to the track containing that sector. Put another way, access time is how long it takes you to get to work; seek time is how long it takes you to get onto the freeway.



Information Presentation Technologies' Personal Server Network (PSN) offers UNIX connectivity and is the first direct challenger to TOPS.

Up to Date

Changes New and Noted

PLUS — the German über-HyperCard that includes 8-bit color, cards up to 3,200 pixels square, six window types, full text styling, color animation, and more — is now available in the United States from Olduvai. PLUS is HyperCard-compatible and can open HyperCard stacks without conversion.

Olduvai, 7520 Red Road, Suite A, South Miami, FL 33143; (305) 665-4665. \$199

THUNDER II is Electronic Arts' second-generation version of its venerable spelling checker. Since Thunder II is a cdev, it installs at boot-up and can load automatically with specific programs. It now packs five types of error recognition (spelling, two kinds of capitalization, double words, and some punctuation), as well as two dictionaries.

Electronic Arts, 1820 Gateway Drive
San Mateo, CA 94404-2497; (415) 571-7171
\$79.95; upgrade, \$30 plus \$3 handling and original Thunder disk

TIMBUKTU, Farallon Computing's screen-sharing package, now boasts file-transfer capabilities. Users can send files, which are sent in the foreground and received in the background, or exchange files. Security has been increased to seven levels (control, observe, send, exchange, read, write, and remove files). Farallon Computing, 2201 Dwight Way
Berkeley, CA 94704; (415) 841-5770
\$149; upgrade: if purchased prior to January 15, 1989, \$40 plus \$10 handling (single copy) or \$40 for first copy, \$5 for each additional serial number, and \$10 per order for site licensees; if purchased after January 15, 1989, \$10 handling only

QUICKEYS, CE Software's popular macro maker, has some new features. QuickTimer lets you set a QuickKeys sequence for automatic execution on a daily or periodic basis. QuickKeys now comes with an installer, QKInstall, which installs the new version while preserving your existing QuickKeys. CE Software, 1854 Fuller Road, P.O. Box 65580, West Des Moines, IA 50265; (515) 224-1995; (800) 523-7638 (orders only). \$99.95, upgrade: \$15

Apple Tops IBM

According to Dataquest, the market-research firm, Apple's total CPU sales (Macs and Apple IIs combined) topped IBM's PS/2 sales in 1988 by 1.27 million units to 1.23 million.

OVERNIGHT DELIVERY
ONLY \$3.00
 (See details below)

GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.

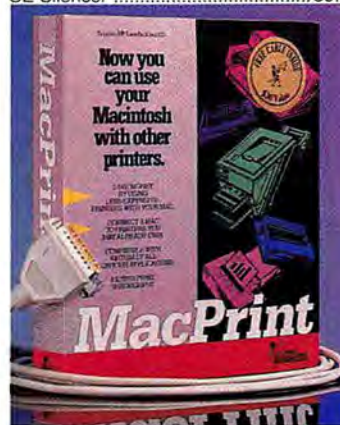


NEW Version 1.51 Quicken (Intuit)
 Forget Financial hassles with Quicken, the world's #1 selling finance software. It's the absolute fastest, easiest way to do your personal or small business bookkeeping. Quicken slashes the time you spend on your finances by automating all your routine financial tasks, from printing recurring checks without typing, to providing detailed tax deduction summaries instantaneously. Flexible, comprehensive financial reports on screen or on paper... income and expenses by category, budget vs. actual comparisons, and more. (finance) \$32.

ACCESSORIES

Apple	
Toner Cartridges LaserWriter	109.
Avery Labels (full line available)	
Color Coded 3.5 Diskette	4.
Laser 3.5 Diskettes	29.
Laser File Folders	6.
Laser Transparencies	22.
Basic Needs, Inc.	
HardTop Keyboard Covers	15.
HardTop ImageWriter Covers	17.
HardTop LaserWriter Covers	16.
Nylon Ripstop Dust Covers - grey only	
ImageWriter or LaserWriter	12.
Mac Plus and keyboard	11.
Mac SE and extd. or reg. keyboard ..	11.
Mac II and extd. keyboard	12.
Utility Pac	11.
Computer Friends, Inc.	
MacInker (IW & IW II)	41.
MacInker Black Ink	3.
Curtis	
Computer Tool Kit (52 pc.)	49.
Curtis Clip	6.
Disk Holder (holds 40)	9.
Jewel Surge Suppressors	
Free Curtis Clip with purchase	Call.
Ergotron	
MacTilt-SE	68.
MacTilt II-RGB	75.
Goldstein & Blair	
The Macintosh Bible	20.

I/O Designs	
Imageware II Carrying Case	49.
Macinware IIcx Carrying Case	89.
Macinware Mac II Carrying Case	99.
Macinware Plus Carrying Case	64.
Macinware SE Carrying Case	75.
Monitorware Apple RGB Case	79.
Ribbons black	4.
Ribbons color	5.
Kalmar	
Rolltop Teak disk holder 45	14.
Rolltop Teak disk holder 90	21.
Rolltop Teak disk holder 135	31.
Kensington	
Anti-Glare Filter	33.
Apple Security Kit	34.
Mac II Stand w/Cable Kit	65.
MasterPiece Mac II	105.
PowerBacker 330 UPS Line	279.
System Saver	64.
MacWarehouse	
Mouse pad	7.
Mobius Products	
Fanny Mac QT	60.
SE Silencer	39.



MacPrint (Insight Development)
 Introducing MacPrint - the easy-to-use software utility that lets you use virtually any Mac application on virtually any printer including HP LaserJet II and IID. MacPrint displays all your printer's fonts for true WYSIWYG performance. Prints text and graphics at your printer's maximum resolution. After the simple installation, it's completely transparent in operation. It's the cost effective print option for your Mac. (utilities) \$79.

Orange Micro	
Grappler L/Q or LS	103.
Polaroid	
Circular Polarizing Filter	35.
Read-Write	
CompuDuster	29.
Kleen & Dry CRT Pads	5.
Computer Care Kit	45.

The HyperWorks Organizer (TimeWorks, Inc.)

The HyperWorks Organizer is a system of interconnected Hypercard stacks that help you manage and control your time, tasks, deadlines and expenses. Organize all your personal and business information, client or customer data; daily, monthly and yearly calendars; projects and plans; expense accounts. Hypercard icons let you perform a variety of tasks. Hypercard environment, combined with Quick-start mini-manual, gets both novice and power user up and running FAST! (hyperware) \$60.

Marathon 030 (Dove)

Put a fast running 68030 chip into your Mac II with the Marathon accelerator board. Features a 256K byte internal data instruction cache and a full 32 bit microprocessor operating at 32 MHZ. Quick and easy to install. (memory) \$999.
FastNet III
 FastNet III launches you onto the Ethernet network and gives you access to today's most popular networking software products. You control the network file transfers, file access, program launching and task-to-task transactions by simple manipulation of desktop icons. It's the price performance choice for Ethernet connectivity. (memory) \$375.



Static Stopper Spray	11.
Smack-a-Mac	
Smack-a-mac	9.
SoundSight	
FastKeys	39.
Targus, Ltd.	
Deluxe Plus/SE-XKB Case (black) ..	75.
ImageWriter II Case (black)	49.
Mac Plus/SE Case (black)	59.

ACCOUNTING AND PERSONAL FINANCES

Aatrix	
Checkwriter	20.
Payroll 3.5	99.
Payroll PLUS	159.
TimeMinder	159.
Bedford	
Simply Accounting	209.
Brown-Wagh Publishing	
MacLedgers	159.
Service Industry Accounting	209.
DAC	
Dac-Easy Light	42.

Intuit	
Quicken 1.5	32.
MECA	
Managing Your Money	125.
Monogram	
Business Sense	279.
Dollars and Sense	81.
Peachtree	
Back to Basic Professional	159.
ShopKeeper Software	
Bill-It	99.
Softsync, Inc.	
Accountant, Inc. Professional	315.
Survivor	
MacMoney 3.02	61.

BLANK MEDIA

B.A.S.F. made in U.S.A	
DS/DD (box of 10)	15.
DS/High Density (1.44 Meg)	29.
Maxell	
DS/DD (box of 10)	19.
Peripheral Land, Inc.	
Turbo 40 Cartridge	115.
Sony	
DS/DD (box of 10)	16.

Casino Master (Centron)

Become a Master of Casino Gambling! Five separate casino games include **Blackjack Ace**, **Crapsmaster**, **Roulette Master**, **Pokermaster**, and **Baccarat Master**. Exact table simulation, betting, bankroll, stored win/lose statistics and manual included. Now in dazzling color on the Mac III! Recommended and used by professional gamblers! (entertainment) \$27. each game or 5 game Casino Master Package for \$49. or Deluxe Mac II color version for \$55.



WEATHERED PLATINUM

The HyperWorks Organizer



A system of interconnected Hypercard stacks that help you manage and control your time, tasks, deadlines and expenses.

This program includes TimeWorks' QUICK-START MINI-MANUAL. Gets you up and running in less than one hour!

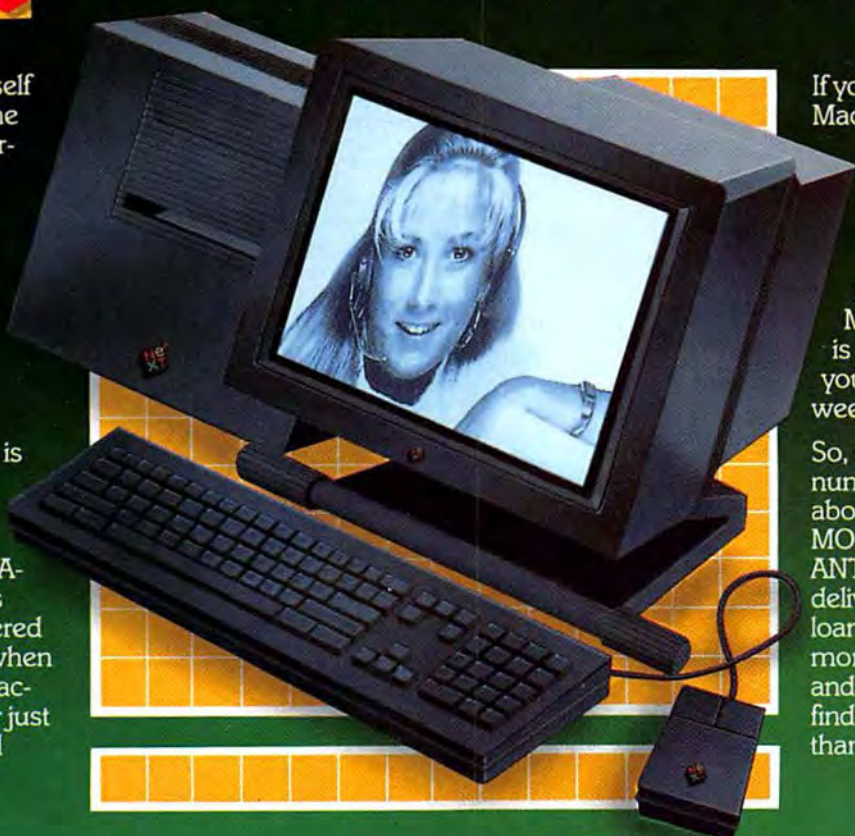
HyperWorks: A Series of HyperCard Applications from TimeWorks

Win

THE NeXT COMPUTER

Just imagine yourself as the winner of the most powerful personal computer ever built! More RAM, more speed, incomparable CD quality sound — Steve Job's personal computer of the 1990's.

All you have to do is enter the brand new MACWAREHOUSE SUPER COMPUTER GIVEAWAY. Your name is automatically entered into the drawing when you order from MacWAREHOUSE. (Or just send in the Official Entry Coupon.)



If you're already a MacWAREHOUSE customer you know that nobody beats our fast, dependable, overnight service. Our friendly staff of Macintosh fanatics is standing by to help you, seven days a week.

So, call our toll free number and find out about our 30 day MONEY BACK GUARANTEE, \$3 overnight delivery service, free loaner drives and much more. For price, quality and service you won't find a better source than MacWAREHOUSE.



FREE CATALOG

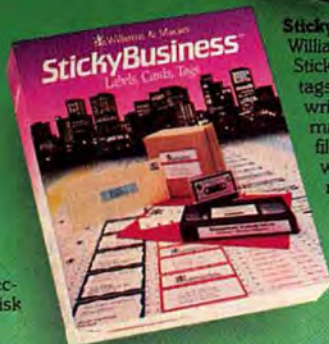
We carry more than 1200 Macintosh products, including all the latest releases and new versions. We pride ourselves on getting new products first. If you can't find what you need call us for a free copy of our latest catalog.

PC Tools Deluxe (Central Point Software)

Best-selling MS-DOS utilities for the Mac. PC Tools Deluxe provides utilities for data recovery, file protection and disk management. Backs up your hard disk drive or set-up floppies. A DA finds files on a hard disk fast! \$46.

Copy II Mac 7.2

One of the most useful and basic collections of utilities for the Mac. Includes Copy II Hard Disk and MacTools (a collection of disk repair utilities) so you can undelete "erased" files, format and verify disks, repair damaged disks, and protect or unprotect disks, as well as backup. (utilities) \$24.



StickyBusiness (William & Macias, Inc.)

William & Macias premiere labeling program. StickyBusiness, prints high-quality labels, cards, tags, and envelopes on Imagewriters and Laserwriters; imports EPS, PICT, PICT2, and bit-mapped graphics; merges text, SYLK, and basic files from any standard Macintosh database or word-processing software; includes preformatted templates for more than 200 labeling products; has a template maker so that you can design your own label templates, and much more. StickyBusiness solves your labeling problems. (utilities) \$99.

TimeMinder (Aatrix Software)

Save time and money. Keep track of the time you spend on each project. TimeMinder lets you enter data manually and accommodates the cost of materials and services. At the end of the month or billing period, it prints out reports and invoices in a variety of formats. If you work on retainer or on variable rates, TimeMinder takes care of all the details and lets you concentrate on the job! (business) \$159.



I'm Kerry, call me at:

MacWAREHOUSE

1-800-255-6227

(1-800-ALL MACS)

Inquiries: 201-367-0440

Canada: 800-255-6447

FAX # 201-905-9279

MONDAY THRU FRIDAY

8 A.M. TO 11 P.M. (Eastern Time)

SATURDAY

8 A.M. TO 8 P.M. (Eastern Time)

NOW OPEN SUNDAYS!

8 A.M. TO 8 P.M.
(Eastern Time)

OFFICIAL ENTRY COUPON

MUJ9

MacWarehouse Giveaway

1690 Oak Street, P.O. Box 1579, Lakewood, NJ 08701

When you order by phone or mail, you are automatically entered in the drawing. You can also mail this coupon.

Name _____

Address _____ Apt. _____

City _____ State _____ Zip _____



FROM MacWAREHOUSE™



Navigate!
Enter the world of Digital Chart Navigation. Display the precise position of your yacht on a detailed chart. Displays land mass, shoal lines, buoys and many other navigation aids. Has full course planning and tracking features. Interface for LORAN, SATNAV, GPS and one chart. Available in color or mono. **Navigate! mono (educational) \$209.**



AntiToxin
Remove viruses and keep them out automatically! Repair virus damaged applications! A dual program of elimination and protection. A powerful decontamination application rids your computer of these pests while an INIT vaccine prevents initial contamination. (security) **\$69.**



Managing Your Money
A fully integrated software program addressing every aspect of personal and small business finance. Write and print checks, set up a personal budget, estimate your taxes and more. (finance) **\$125.**



Dust Covers
Basic Needs dust covers look great! Machine stitched and custom fitted. The covers are made from washable rip-stop nylon and won't crack, yellow, or fade like similarly priced vinyl. (accessories) **starting at \$11.00**

Preferred Publishers	
DAtabase	75.
Vantage	59.
Solutions	
SmartScrap & The Clipper 2.0	46.
TENpointO	
Open IT!	49.

DESKTOP PUBLISHING PRODUCTS

Aldus	
PageMaker 3.01	389.
Color Extension	179.
Blue Sky Research	
Textures	375.
Broderbund	
DTP Advisor	47.
Emerald City Software	
Smart Art I—Text Effects	89.
Icom Simulations	
MacKern	119.
Letraset	
ColorStudio	Call
ImageStudio	275.
Ready, Set, Go!	275.
Olduvai	
Read-It! 2.0 (OCR)	249.
Read-It! Personal	99.



Read-It! TS (Thunderscan)	79.
Quark	
QuarkStyle	189.
Xpress	499.
Springboard	
Springboard Publisher	109.
U.S. MicroLabs, Inc.	
FontSizer	79.

DISK DRIVES/BOARDS

Aristotle Industries, Inc.	
HardPac Mac 20 Meg	549.
HardPac Mac 40 Meg	799.
HardPac Mac 80 Meg	1195.
HardPac Mac 105 Meg	1395.
CMS	
MacStack 20 Meg	529.
MacStack 30 Meg	545.
MacStack 45 Meg	625.
MacStack 60 Meg	699.
MacStack 80 Meg	799.
Cutting Edge	
800K External Floppy Drive	149.
Under the Mac 20 Meg	439.
Under the Mac 30+ Meg	499.
Under the Mac 40+ Meg	559.
Under the Mac 65+ Meg	649.
Under the Mac 80+ Meg	749.
Dayna Communications	
Dayna File Single 360K (5 1/4")	529.
Dayna File Dual 360K & 1.44M	669.
Dolphin Systems Tech	
Integra 20 Meg	549.
Integra 30 Meg	599.
Integra 40 Meg	769.
Integra 60 Meg	819.
Integra 80 Meg	1179.
Flipper 150 Meg Tape Backup	1439.
Flipper Removable 44 Meg	1195.
Kennect Technology	
Drive 2.4	375.

Gofer (Microlytics)

Call for Gofer with just one keystroke to search and find information on your disk files. With this high speed test retrieval accessory just enter one or two words and have a document at your fingertips within seconds! Works with almost any file. (utilities) **\$45.**



ProArt Professional Art Library (Multi Ad Services)

Clip Art from an Industry Leader. Over 100 EPS illustrations in each of the three volumes (Business, Holidays, and Sports). Created by talented illustrators. Tasteful, quality images will improve the appearance of all your Desk Top projects. Disk versions include a binder, with a pictorial index. (graphics) **\$95.** each. CD-ROM **\$229.**

Davidson	
Math Blaster	27.
Speed Reader II	36.
First Byte	
The Dinosaur Discovery Kit	27.
The Puzzle Storybook	27.
The Rhyming Notebook	27.
Fair Tide Technologies	
Navigate!	209.
Great Wave	
KidsTime 1.2	26.
NumberMaze	27.
Learning Company	
Reader Rabbit	32.
MicroTech	
Elementary Signer	49.
Finger Signer	29.
The Software Toolworks	
Mavis Beacon Teaches Typing	35.
Voice & Video Instruction Videos	
HyperCard or Pagemaker 3.0	ea 35.
Word 4.0 Video Tape	35.

ENTERTAINMENT

Access Software, Inc.	
World Class Leader Board	28.
Artworx	
Daily Double Horse Racing	19.
GrailQuest	19.
Broderbund	
Ancient Art of War At Sea	27.
Shufflepuck Cafe	24.
Where in the World is Carmen	27.

EDUCATIONAL PERSONAL

BrightStar	
Alphabet Blocks 3.01	32.
Talking Tiles	69.
Bootware Software	
ResumeWriter Pro	60.

Extended Keyboard Carrying Case (Targus)

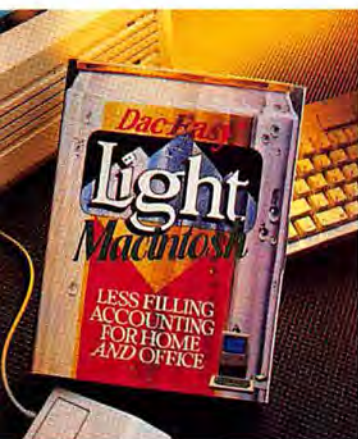
Pamper your Mac with a Targus carrying case Made of Zilicone treated nylon to give you waterproof durability and an impact absorbing high-density foam layer with a soft protective lining for complete protection. Cushioned shoulder pad and handles provide extra comfort and convenience. Plus there's room for everything from your Mac, a hard disk drive, and the extended keyboard to pockets for your mouse, floppies, cables, and pens. Full Targus Macintosh line available. (accessories) **\$75.**



MORE FOR YOUR MONEY...

BUSINESS AND PRESENTATION

Access Technology	
Trapeze 2.1	149.
Adobe Systems, Inc.	
TrueForm	275.
AEC Management Systems	
FastTrack Schedule	115.
Aldus	
Persuasion 1.0	385.
Ashton-Tate	
Full Impact	249.
BreakThrough Productions	
Market Master R/A	245.
Claris	
MacProject II	379.
SmartForm Designer w/Assistant	309.
Cognition Technology	
MacSMARTS PRO	249.
Cricket	
Cricket Graph 1.3	115.
Cricket Presents	289.
HyperPress Publishing	
Intelligent Developer	249.
Informix	
WingZ	259.
MetaComet	
Accu-Weather Forecaster	59.
Microsoft	
Excel 2.2	255.
PowerPoint 2.1	255.
Works 2.0	189.
Nolo Press	
For the Record	29.
WillMaker	32.



DacEasy Light (Dac Software)
Ideal for the home and/or sole proprietorship, here's the perfect solution to your finances. DacEasy Light tracks a 12-month budget, writes checks, prepares invoices and reports financial statements. Two pre-defined chart of accounts, one for home and one for the office, give you simple, easy accounting without having to know a debit from a credit. Password protection, pop-up calculator, and more are added features that make DacEasy Light fun to use. Again, whether at home or at work! (accounting) **\$45.**

Power Up	
Calendar Creator	38.
FastForms! Construction Kit	89.
ProPlus	
Wall Street Investor	469.
Satori	
Bulk Mailer 3.3	78.
Softview	
FormSet	55.
MacInUse	42.
Symantec	
More II 2.01	255.
Symmetry	
KeyPlan	339.
Synex	
Mac Envelope 4.1	55.
Vertical Solutions	
FastLabel	49.

Infinity 40

(Peripheral Land, Inc.)
Freedom from limited capacity imposed by fixed hard disks! Removable cartridge drive. Get infinite storage with additional cartridges at little more than the cost of a standard diskette. **\$1235.**

The TurboFloppy 1.4

Gives you what Apple didn't: 1.44 MB Mac floppy disks. SCSI interface for the greatest possible speed. No special chips or interfaces required, compatible with MacPlus and up. (drives) **\$329.**

Software is also available: TurboBack for \$49. TurboOptimizer for \$25. and TurboSpool or TurboCache ea. \$59.



CAD/CAE

Claris	
ClarisCAD	629.
Generic Software	
Generic CADD Level 1	85.
Symbols Libraries available	Call
Graphsoft	
Blueprint	349.
MiniCad Plus	519.
Innovative Data	
MacDraft	145.
Dreams	269.
I.S.I.	
Precision	399.

COMMUNICATIONS

CE Software	
QuickMail 2.0	205.
CompuServe	
CompuServe Navigator	45.
CompuServe Subscription Kit	24.
DataVIZ	
MacLink Plus w/Cable 3.0	139.
MacLink Plus/Translators	119.
Dow Jones	
News/Retrieval Membership	24.
FreeSoft	
Red Ryder 10.3	54.
Hayes	
Smartcom II 3.1	88.
Infosphere	
Liaison	179.
InSignia Solutions	
Soft PC (Mac II)	249.
Prometheus	
Acknowledge	329.
MacKnowledge	149.
Software Ventures	
Microphone II v.3.0	219.

Synergy	
Versa Term Pro 3.0	179.
Traveling Software	
Lap-Link	83.

DATABASE SOFTWARE

Acius	
4th Dimension	389.
AEC Management Systems	
AEC Information Manager	415.
Ashton-Tate	
dBase Mac	295.
Claris	
FileMaker II	229.
Fox Software	
FoxBASE+/Mac	265.
FoxBASE+/Mac MultiUser	315.
FoxBASE+/Mac Runtime	269.
Microsoft	
File 2.0	129.
Odesta	
Double Helix II	339.
GeoQuery	199.
ProVUE	
Panorama	205.

DESK ACCESSORIES

Affinity	
AffiniFile	45.
Casady & Greene	
QuickDEX	32.
Exodus Software	
ExpressWrite	65.
Retriever	59.
JAM Software	
Smart Alarms & Appointment Diary	49.
Smart Alarms (1 - 4 users)	99.
Smart Alarms (5 - 8 users)	149.
Smart Alarms (9 - 16 users)	199.

FastLabel 1.2.1

End label hassles with FastLabel, the revolutionary way to print labels on the Imagewriter and Laserwriter. Preformatting instantly creates labels. One step text loading from any commercial database. Save hours of your valuable time! (business) **\$49.**



WingZ

The first Graphic Spreadsheet. Number crunching power that's unsurpassed. Page perfect presentations in one window, on one page, with one product! Combine text, graphs, charts, illustrations and worksheet data printed on any page. Revolutionizes the way business people view spreadsheets! (business) **\$259.**



Dow Jones News/Retrieval

Dow Jones News/Retrieval membership package comes with E-Z Online communications software, provides the new user with 5 hours of free online time. Connects to more than 50 databases, up-to-the minute news and financial data, plus extensive reference library. (communications) **\$24.**



Accu-Weather Forecaster

Instant, convenient and reliable weather information direct from the nation's #1 weather service. Quickly download national weather data by modem, then display it in easy to read maps, graphs, charts and forecasts. Hourly updates are available for every region of the country. Ideal for aviation, boating, construction and travel. (business) **\$59.**



- VISA and MASTERCARD accepted. No surcharge.
 - Your credit card will not be charged until your order is shipped.
 - If we must ship a partial order, we pay the freight on the remaining portion.
 - All U.S. shipments are insured at no extra charge.
 - C.O.D. orders accepted (add \$6.00 including shipping) — \$1,000 maximum. Cash, money order, or cashier's check.
 - Corporate purchase orders accepted subject to credit approval.
 - All products are covered by a 120 day limited warranty.
 - CT residents add 8% sales tax. NJ residents add 6.0% sales tax.
- SHIPPING**
- All orders add \$3.00 per order. We ship Airborne Express overnight unless UPS ground delivers overnight. (Some rural areas require an extra day.)
 - Orders placed by 7:00 pm Eastern time (weekdays) for "in stock" items ship same day (barring system failure, etc.) for overnight delivery.
 - C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS ground). Charge is \$6 including shipping.
 - Alaska, Hawaii, outside continental U.S., APO/FPO call 201-367-0440 for information.

MUJ9

*Defective software replaced immediately. Hardware replaced or repaired at our discretion.
I'm Kerry, call me at:
1-800-255-6227
(1-800-ALL-MACS)
Inquiries: 201-367-0440 Canada: 800-255-6447 FAX # 201-905-9279

MacWAREHOUSE™

1690 Oak Street, P.O. Box 1579,
Lakewood, NJ 08701
MONDAY THRU FRIDAY 8 A.M. TO 11 P.M. (Eastern Time)
SATURDAY 8 A.M. TO 8 P.M. (Eastern Time)
NOW OPEN SUNDAYS! 8 A.M. TO 8 P.M. (Eastern Time)



GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.

OVERNIGHT DELIVERY ONLY \$3.00



Read-It OCR 2.0 (Olduvai)
Highest Rated (4 1/2 mice MacUser Rating) Brings Optical Character Recognition to your Mac. Use any scanner to input virtually any printed text, including typeset and laser printed documents. New "Easy Learn" super-fast training option, built-in speech option and file export to any Macintosh application. Requires only one Megabyte of RAM. (desktop publishing) **\$249.**

PCAI/XOR
Lunar Rescue 34.
MacGolf 2.0 35.
MacGolf Classic 54.
Road Racer 39.

Business 1 65.
Adobe
Illustrator 88 299.
Streamline 239.
Aegis Development, Inc.
Showcase F/X 199.
Aldus
Freehand 2.0 349.
Broderbund
Drawing Table 75.
PosterMaker Plus 35.
Casady & Greene
Vivid Impressions Vol. 1 69.
Claris
MacDraw II 2.0 309.
MacPaint 2.0 99.
Cricket
Cricket Color Paint 179.
Cricket Draw 168.
Cricket Paint 99.
Deneba
Canvas 2.0 159.
Dream Maker
Clippings, Business Images 85.
MacGallery 27.
Electronic Arts
Studio/1 99.
Studio/8 309.

Bullseye
Ferrari Grand Prix or P51 ea 32.
Centron Software, Inc.
BlackJack or CrapsMaster ea 27.
CasinoMaster (5 pack) 49.
Discovery Software
Arkanoïd 27.
Electronic Arts
Starfleet I: The War Begins 36.
Chuck Yeager Adv. Flight Trainer 32.
HyperPress Publishing
Silver Screen 42.
Miles Computing
Fool's Errand 32.
Puzzle Gallery 27.
Mindscape
Balance of Power, Deja Vu ea 30.
Nemesis
Go Master 49.
Joseki Tutor 30.



MacEnvelope 4.1 (Synex)

MacEnvelope gives your mail that "special touch". You can create layouts, adjust fonts and styles, import graphics, and even print in color (on the ImageWriter II). It even prints Postal Bar Codes giving you the most reliable postal deliveries possible (saves money on bulk mailings!). Stores up to 1600 names and addresses and sorts alphabetically or by zip code. (business) **\$55.**

Spectrum HoloByte
Falcon 2.0 32.
PT109 or Gato ea 26.
Solitaire Royale or Tetris ea 20.
Springboard
Hidden Agenda 36.
The Software Toolworks
Chessmaster 2100 32.
Life & Death 34.
The Hunt for Red October 32.

Fonts

Adobe
Fonts (All Avail.) Call.
Forms and Schedules 299.
Newsletters 249.
Presentations 299.
Textures, Fills, and Patterns 139.
Altsys
Fontastic Plus 2.02 52.
The Art Importer 69.
Beyond, Inc.
MenuFonts 2.02 29.
General Computer Company
Fonts Plus Package 250.
Letraset
LetraStudio 289.
LetraFonts (various) ea 69.
Tactic Software
ArtFonts Vol.1 or 2 55.
Orange Micro
Alphabits 69.

Graphics and Design

3G Graphics
Images w/Impact
Graphics & Symbols 1 52.

MacroMind
MacroMind Director 449.
VideoWorks II 199.
VideoWorks II HyperCard Driver 60.
Miles
Mac The Knife (All Volumes) 39.
Multi Ad Services
ProArt: Bus., Sports or Holidays ea 95.
ProArt: Trilogy CD format 229.
NuEquation
NuPaint 99.
Paracomp
Swivel 3D 289.
Silicon Beach
Digital Darkroom 259.
Super 3D 2.0 325.
SuperPaint 2.0 129.
SuperMac
PixelPaint 2.0 199.
PixelPaint Professional 409.

Smart Alarms and Appointment Diaries (JAM)
The ultimate reminder system. Smart Alarms desk accessory creates reminders which interrupt you at an appointed time. Features snooze up to 1 hour, printing, choice of beeps, & text editing reminders. Appointment Diary desk accessory calendar for appointments features: Auto-layout, Day Layout, set reminders directly into Smart Alarms. Week at a view, Month at a glance, printing. Multi-User versions require AppleShare or TOPS. (desk accessories) **single version \$99. 5 - 8 users \$149.**



Smalltalk/VMac

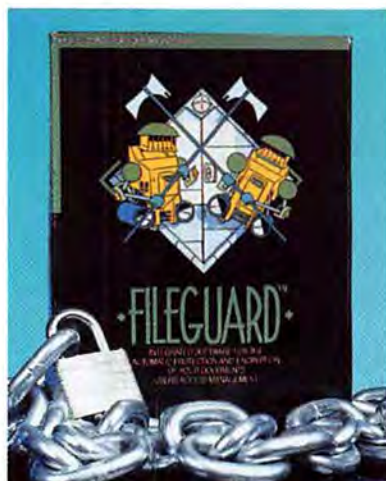
This Mac based object-oriented development environment provides developers with the power to create full-blown mainstream products at affordable prices. Compatible with Smalltalk/V on IBM PC's. Works under Multifinder and has complete access to the Mac Toolbox. Features multitasking, a debugger, supports large data structures and an extensive manual. (language) **\$103.**



Kraft Premium III Joystick
The Kraft Premium III Joystick is the same as the QuickStick, but it connects to the ADB port of the Mac SE or Mac II. Also works with the Apple Iigs. (input/output) **\$51.**

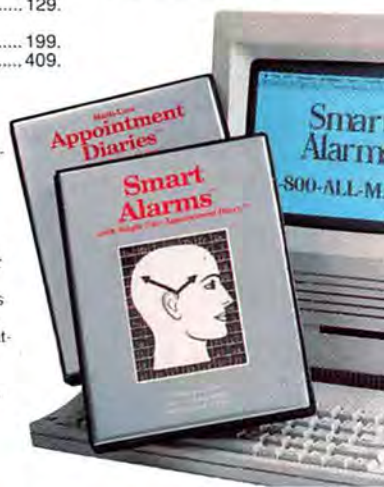


GrailQuest
Offers hours of entertainment for those who enjoy adventure games with adult situations and sensibilities, features interactive, digitized graphics and sound. (entertainment) **\$19.**



FileGuard (A.S.D)

Operating totally transparently, FileGuard is the integrated encryption utility that provides the most comprehensive and transparent solution to today's security and confidentiality problems. Upon saving a new document, FileGuard gives you the option to password protect it. Encryption is performed automatically when you quit your application. Opening protected documents is just as easy and automatic. When you double-click on an encrypted document, FileGuard asks for your password, then immediately decrypts and launches the appropriate application. The document is automatically re-encrypted when you quit. (security) **\$129.**





Mac - 101 Keyboards (DataDesk Intl.)

Features 101 keys including a numeric keypad, a separate T-shaped cursor keypad, Cancel Key, Option and Command keys at both ends, definable function keys, plus scrolling, page control, and zooming keys. Manufacturer's two year warranty. (input/output) **\$145. International Versions also available**



HyperBible

Put new life into your study of the Bible. Over 100,000 notes and cross references. Easy word and phrase search of scripture. Ready made studies for meetings. (hyperware) Available in the New International Version **\$179**, or the King James Version **\$149**.



Virex

Virus detection and treatment software. Intended for individuals that have unusually high risk of exposure to viral infections. Including Fortune 500 companies, and desktop publishing firms. Useful for those who use public domain software, or networks. (security) **\$69**.



Bill-IT Version 2

Integrated billing for small businesses that works from a straight inventory or services list. Track sales, print invoices and statements, maintain customer lists. Users include consultants, clubs etc. (finance) **\$99**.

Tactic Software

Art Clips	59.
Zedcor	
Deskpoint 2.0	69.

HARDWARE AND PERIPHERALS

Cambridge North America

Z88 Portable Computer	799.
Z88 AC Adapter	9.
Z88 Pocket Modem	225.
Z88 512K RAM Cartridge	359.
The Complete PC	
Half-Page Scanner	379.
Page Scanner	799.
DEST	
Dest PC Scan Plus	SPECIAL 799.

Dolphin Subsystems



The intelligent choice for Apple Macintosh mass storage. **Integra** Zero footprint external hard drives from 20mb-100mb capacity. **Flipper 44mb** removable hard disk high performance (25ms) offers unlimited storage and convenient portability. **Flipper 150mb** high speed SCSI tape with FileX/Image Backup. (disk drives) see line listings for prices.



General Computing Company

WriteMove Ink Jet Printer	585.
Magnavox	
Color Monitor 14"	599.
Seikosha America	
Seikosha Printer (dot-matrix)	235.
ThunderWare	
LightningScan	409.
ThunderScan 5.0	189.

HYPERWARE

Activision	
Focal Point II	119.
Reports for HyperCard	69.
Bantam	
Complete HyperCard Handbook	23.
Beacon Technologies	
HyperBible International Version ...	179.
HyperBible King James Version ...	149.
BrainPower	
ArchiText	179.
Bright Star Technology	
HyperAnimator	99.
HyperPress Publishing	
Script Expert	46.
ICOM Simulations	
HyperTMON	75.
MicroMaps	
HyperAtlas	64.
Power Up	
HyperTutor	29.

Fastkeys (SoundSight)

Speed up your computing by 50%! Bring the keyboard to your fingertips. Imagine simply pressing Fastkeys on your mouse, trackball or pad to perform everything from printing to deleting. Execute mouse operations INSTANTLY! Shift-Select is now a one hand operation as well as cut, paste, copy, quit, undo, open, close... Virtually anything you choose. (accessories) **\$39**.



Silicon Beach

SuperCard	129.
Springboard	
Family Matters	28.
Symmetry	
HyperDA	35.
TimeWorks	
HyperWorks Organizer	60.



Microsoft

QuickBasic	65.
Shana Corporation	
Inside Out	369.
SmethersBarnes	
Prototyper	149.
Symantec	
Lightspeed C 3.0	169.
Lightspeed Pascal	95.
Zedcor	
ZBasic 5.0	99.

MEMORY UPGRADES/ACCELERATORS

1 MEG SIMMS

Low Profile, 100ns High Quality Single In-Line Memory Modules for MacPlus, SE, II, IIX. 2 yr. Warranty. **New low price \$139.**

Dove (full line available)

FastNet SCSI	785.
FastNet II	565.
FastNet III	375.
FastNet SE or SE/30	375.
MaraThon 030 Accelerator	999.
MaraThon 030X	999.
MaraThon SP or Multi-Comm	315.
MacSnap 2S	349.
MacSnap 4S	698.

Acta Advantage (Symmetry)

With Acta, you can jot down your ideas whenever they occur. Later you can export the outline to a word processor or spreadsheet for more serious work. Acta outlines lists of things to do, items needed, people on a project, appointments, name and address books, or any set of data you need to keep handy. Acta can sort, find, replace, mix fonts within topics, and accepts graphics too. (word processors) **\$65**.



Trendware Corporation

HyperTools #1 or #2	ea 52.
---------------------------	--------

INPUT/OUTPUT

Cutting Edge	
CE-105 ADB Keyboard	125.
DataDesk Intl.	
Mac 101 Keyboards	145.
Kensington	
New Turbo Mouse	109.
Koala	
MacVision 2.0	219.
Kraft	
ADB Joystick Premium III (SE&II)	51.
Kurta	
IS/ADB Tablet 8 1/2 x 11	259.
IS/ADB Tablet 12 x 12	385.
IS/ADB Tablet 12 x 17	625.
Cordless 4 Button Cursor	65.
Mouse Systems	
A+ Mouse (512/Plus or SE/II)	Call.
Summagraphics	
Bit Pad Plus	325.

LANGUAGES

Digitalk, Inc.	
Smalltalk/V MAC	139.
Manx Software Systems	
Aztec C or Unitools	ea 65.
Aztec C+SDB or C+MPW	ea 99.

OVERNIGHT DELIVERY
ONLY \$3.00
 (See details below)

GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



MacKnowledge (Prometheus Products, Inc.)

MacKnowledge is the latest communications software available for your Macintosh. Icon based scripts provide instant access to all major online services with just the click of your mouse. The TAL scripting language provides all the capabilities for customizing and automating your own online sessions or the record function will watch your session and create an icon based script automatically. Also provides support of 9600 bps and MNP modems. (communications) \$149.

MODEMS/FAX

Abaton	
InterFax12/48	325.
Best Data Products	
SmartOne 2400/1200	149.
EPIC Technology	
2400II Internal Modem	315.
Hayes	
Smartmodem 1200	299.
Smartmodem 2400	449.
Smartmodem 9600 (V series)	985.
Prometheus	
ProModem 2400 SE Int.	209.
ProModem 2400M	199.
STF Technologies	
FAXstf Modem	525.
Supra	
Supra Modem 2400	149.
US Robotics	
Courier 9600 Modem	699.



MacSMARTS PRO (Cognition Technology)

Work smarter not harder with this hypermedia based expert system tool. MacSMARTS Professional provides full hypertext, database access and computational power for diagnosing, designing and interpreting complex information quickly and simply. Features intuitive graphical interface with color support on the Mac II and links to HyperCard stacks. Boost productivity by solving problems 10 times faster and save money by doing it right the first time! (business) \$249.

MUSIC AND SOUND

Altech	
MIDI Interface	59.
MIDI Basic	30.
Bogas Productions	
Super Studio Session 2.0	69.
Coda	
MacDrums	31.
Perceive	50.
Electronic Arts	
Deluxe Music Construction 2.5	84.
Esthetic Engineering	
Music Mouse	49.
Farallon Computing	
MacRecorder (records sound)	135.
First Byte	
SmoothTalker	33.
Graphic Notes	
Music Publisher	375.
Great Wave	
Concertware+MIDI 4.0	79.
HIPP Software	
Harmony Grid	59.
Impulse	
Audio Digitizer w/SoundWave	139.
Intelligent Music	
OvalTune	95.
Passport Designs	
Master Tracks Pro 3.0	259.
NoteWriter	189.
Passport MIDI Interface	95.
Primera Software	
Different Drummer	59.
Resonate	
Listen 2.0	62.

Canvas 2.0 (Deneba)

This revolutionary upgrade sets the standard for drawing programs by blending powerful drawing capabilities with convenient easy-to-use paint features. Features include auto trace, multi-point Bezier curves, unlimited layers, 16.7 million colors for 24-bit Mac II support, hairlines to 1/1000th of an inch, improved precision to 64,000 dpi, PostScript gray scales in one degree increments, TIFF and bitmap editing, and zoom capacity ranging from 3% to 3,000%. (graphics) \$159.

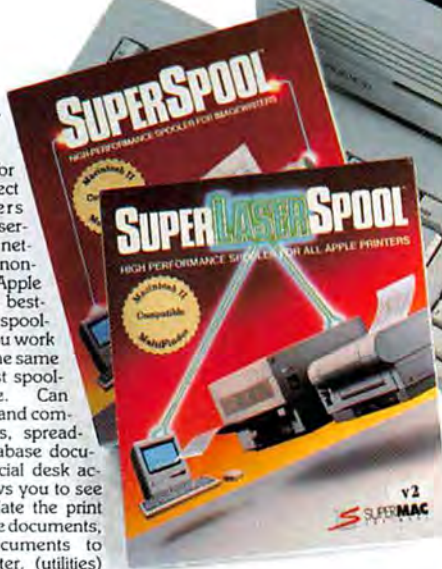


NETWORKING PRODUCTS

Connect Inc.	
MacNet	43.
Farallon	
Timbuktu 2.0.1	65.
Timbuktu Remote 1.0.1	195.
TrafficWatch	139.
PhoneNET PLUS	35.
PhoneNET Repeater	325.
PhoneNet Star Controller	1199.
Punch Down Block Tool	9.
Shiva	
NetBridge	349.
NetSerial X232	289.
TOPS	
NetPrint	119.
FlashBox	125.
FlashCard	169.
Repeater	129.
Teleconnectors	29.
TOPS 2.1	149.
TOPS DOS	119.

SuperSpool/ SuperLaserSpool

(Supermac)
 SuperSpool for direct connect ImageWriters and SuperLaserSpool for all networked or non-networked Apple printers, are best-selling print spoolers that let you work and print at the same time. Fastest spoolers available. Can handle large and complex graphics, spreadsheet or database documents. Special desk accessory allows you to see and manipulate the print queue; delete documents, re-order documents to another printer. (utilities)
SuperSpool \$53. or SuperLaserSpool \$79.



SECURITY AND VIRUS PROTECTION

ASD Software, Inc.	
FileGuard	129.
HJC Software, Inc.	
Virex	69.
Kent Marsh	
MacSafe	87.
NightWatch	87.
Mainstay	
AntiToxin	65.
Symantec Corporation	
S. A. M.	69.

SPELLING/DICTIONARY THESAURUS CHECKERS

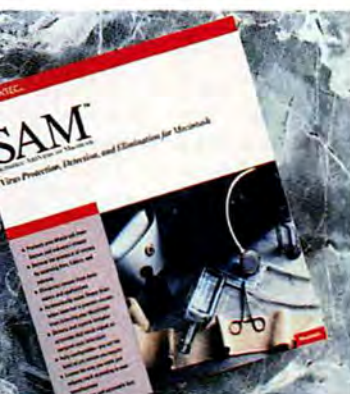
Aegis Development, Inc.	
Doug Clapp's Word Tools	42.
Deneba Software	
BigThesaurus	59.
Spelling Coach Pro	115.
Electronic Arts	
Thunder II	52.

OvalTune (Intelligent Music)

Create powerful audio-visual events by associating graphics with music. Transform graphics from any Macintosh graphics program in synchronization with music. OvalTune saves graphics in PICT images for playback or manipulation. OvalTune music can be played through the Macintosh speaker using Sample Player. OvalTune comes with 128 sampled sounds already programmed. OvalTune can also play through MIDI synthesizers. Requires: Mac Plus, SE, or II. (music) \$95.



STOP PRESS



Symantec Anti-Virus for the Mac (SAM) (Symantec)

SAM (Symantec Anti-Virus for the Mac) detects any viruses by monitoring the suspicious activities that characterize them. If it finds one, it eliminates it immediately, protecting your Mac and software from infection. SAM scans floppies whenever you insert them, and at your request, will scan a file, folder, or volume for both known and unknown viruses. SAM has an easy to use interface and on-line Help. (utilities) \$65.

Microlytics	
Word Finder 2.0	33.
Sensible Software	
BookEnds	53.
Sensible Grammar	53.

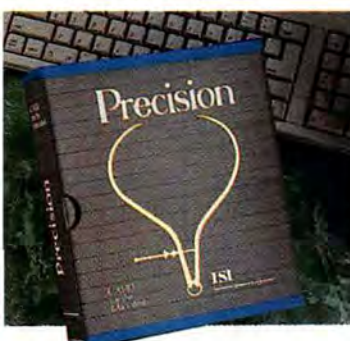
STATISTICAL ANALYSIS

Abacus Concepts	
StatView II	295.
StatView SE+Graphics	225.
BrainPower	
StatView 512+ (requires 512k)	149.
D2 Software	
MacSpin 2.0	189.
Odesta	
Data Desk Professional	289.
Paracomp	
Milo	159.
Select Micro Systems, Inc.	
Exstlix	219.
Wolfram Research	
Mathematica (SE)	450.

UTILITIES

Abbott Systems	
CanOpener	65.
Affinity	
Tempo II	89.

Precision (ISI)
A high performance 2 1/2D CADD solution for the Mac. This package offers extensive drawing and editing features such as global replace symbols, in-depth analysis, powerful macro files and complete dimensioning capabilities. Includes a complete range of plotter drivers, import/export utilities for DXF and IGES files, 800 phone support and over 1000 architectural and mechanical symbols. (cad/cae) \$399.



ALSoft	
DiskExpress	49.
Font/DA Juggler	42.
MasterDisk	49.
Master Juggler	64.
Berkeley System Design, Inc.	
Stepping Out II	52.
CE Software	
DiskTop 3.0.2	27.
QuickKeys (macro programmer)	52.
Caere	
OmniPage	559.
Central Point Software	
Copy II Mac (with MacTools)	24.
PC Tools Deluxe For Mac	46.
Emerald City Software	
LaserTalk 1.0	187.
Fifth Generation	
FastBack II	109.
PowerStation 2.5	35.
Pyro	15.
Suitcase II	45.
GO Technologies	
MacTree Plus	46.
ICOM Simulations	
On Cue	35.
Insight Development	
MacPrint	79.
LaCie Ltd.	
SilverServer	89.
Magic Software	
AutoSave II	29.
POWERICONS	39.
POWERMenus	39.
Mainstay	
Capture	42.
TypeNow	27.
Microlytics	
GOfer	43.
Olduvai	
MultiClip	55.
PCPC	
HFS Backup 3.0	54.
Peripheral Land, Inc.	
TurboBack	49.
TurboCache or Turbo Spool	ea. 59.
TurboOptimizer	25.
SuperMac	
DiskFit 1.5 or SuperSpool 5.0	ea. 53.
Sentinel 2.0	89.
SuperLaserSpool 2.0	79.
Symantec Corporation	
Symantec Utilities for Macintosh	65.
Tactic Software	
ClipShare	99.
FontShare	149.
Williams & Macias	
DiskFinder	29.
myDiskLabeler	34.
StickyBusiness	99.
XTree Company	
XTree Mac	52.

WORD PROCESSORS AND OUTLINERS

Access Technology, Inc.	
MindWrite 2.1	95.
Ashton-Tate	
FullWrite Professional	265.
Claris	
MacWrite II	239.
Microsoft	
Word 4	255.
Niles & Associates	
End Note	82.
Symmetry	
Acta Advantage w/DA	65.
T/Maker	
WriteNow 2.0	119.
WordPerfect Corp.	
WordPerfect	185.
Working Software	
QuickLetter	75.

CONTEST RULES 1. Entries must be received on or before 1/31/90. 2. Winners selected in random drawings by attorneys for MacWarehouse Inc. (MWH), whose decisions are final. 3. Next Computer prize subject to availability. MWH reserves the right to substitute wholesale cash value up to \$10,000. 4. Winners responsible for taxes. 5. Odds of winning depend on number of entries. All prizes will be awarded. 6. MWH will announce the winners on or around 2/28/90. Winners notified by mail. Dates subject to change at the discretion of MWH. If unable to contact any winner, an alternate will be selected by random drawing. 7. Contest is open to US residents, except where prohibited by law. Employees of MWH and suppliers not eligible. 8. Prizes - one Next Computer including keyboard and monitor and 150 software and media prizes.

Please circle 13 on reader service card.



800K Drive

The Cutting Edge 800K drive's attractive styling, quiet performance, and high-tech reliability make it our most popular floppy drive. Features an LED light to indicate disk access and a hinged door over the disk insertion slot to keep the mechanism clean. One year manufacturers warranty. (disk drives) \$149.

Microsoft Excel 2.2 (Microsoft)

Microsoft Excel is the acknowledged standard for power and reliability for macintosh business programs. Superior design, intuitive ease-of-use, unmatched training and support, and seamless integration with other leading business programs, like Microsoft Word. Excel is a spreadsheet designed for the real world - where the average user spends most of the time doing numeric analysis, serious number crunching. What-If statements, investments, and model simulations. Now users can access the full 8 MB of Mac Memory! (business) \$255.

I'm Donna, call me at:

MacWAREHOUSE™

1-800-255-6227

(1-800-ALL MACS)

Inquiries: 201-367-0440

Canada: 800-255-6447

FAX # 201-905-9279

MONDAY THRU FRIDAY

8 A.M. TO 11 P.M. (Eastern Time)

SATURDAY

8 A.M. TO 8 P.M. (Eastern Time)

NOW OPEN SUNDAYS!

8 A.M. TO 8 P.M.

(Eastern Time)

NEW! Price breakthrough! Under the Mac Drives (Cutting Edge)

The Cutting Edge Under the Mac Drive hard disk drives are quiet and reliable with access times down to 20 milliseconds making it almost three times faster than most. Push button external SCSI address switch and removable SCSI terminators allow easy daisy chaining up to 7 SCSI devices. Sizes available 20 megs to 80 megs (disk drives) 20 meg only \$439. 30+ meg only \$499. 40+ meg only \$559.



NUMBER CRUNCHING

Microsoft Excel 2.2

Microsoft's long-awaited upgrade of Excel reconfirms that the spreadsheet king still reigns.

X Microsoft set the microcomputer world on its ear when it introduced Excel in 1985, setting a new spreadsheet standard and legitimizing the Macintosh for many corporate users. People actually bought Macintoshes just to be able to use Excel. It enjoyed such a lead over the competition, capturing up to 90 percent of the Mac spreadsheet market, that complacency was almost inevitable.

Sure enough, by 1989, Excel for the Macintosh was very long in the tooth, while Excel for the IBM PC seemed to be getting all of Microsoft's attention. Even the semimajor update, Excel 1.5, didn't really address all of the program's shortcomings. Microsoft's complacency created an opportunity for its competitors: Ashton-Tate's Full Impact and Informix's Wingz both had strong debuts. With a host of spiffy features, many that Excel lacked, the rebels began an assault on Excel's supremacy. But Microsoft wasn't completely asleep at the wheel, and with

version 2.2, the empire strikes back.

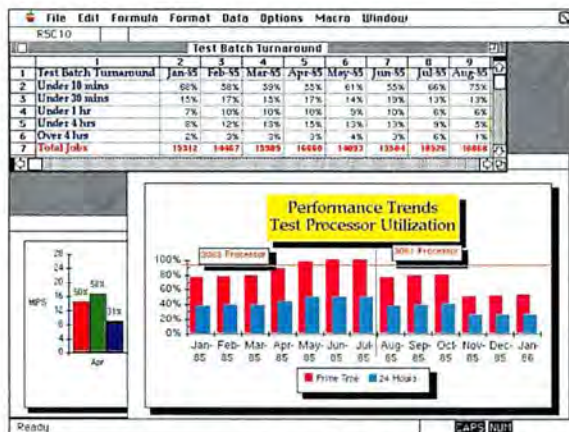
WHAT IT IS Excel 2.2 is good news, too, because it's been completely rewritten and has many new features. Most major user complaints about previous versions have been addressed. The 1-megabyte limit, a major stumbling block for MultiFinder users, has finally been vanquished. Up to 256 fonts per worksheet can be used in any style. Notes can be attached to any cell. Search-and-replace commands for finding values, formulas, or text in cells or notes have been added.

Macros, an area where Excel was already strong, have been made even more powerful. New macro commands can watch for a specific time or for users pressing specific keys or activating particular windows. Text files can be created, opened, read from, written to, and saved with macro functions. All of the charting commands now have macro equivalents. You can even launch other applications from a macro when using MultiFinder or call custom-programmed functions or routines. When used with the Dialog Editor (introduced with version 1.5), Excel 2.2 can create custom applications.

There are also many smaller touches that are new. Every menu item is accessible from the keyboard, and Excel offers the same Full Menus/Short Menus choice that Word introduced. New commands include Repeat Command, which repeats the most-recent action; Justify, to wrap text to a cell range; and Hide and Unhide, to hide supporting worksheets or macro

sheets. New Paste options are offered, such as Skip Blanks, Transpose a range of cells, and Paste Link to link cells and/or worksheets automatically. Excel 2.2 adds many customization options such as user-defined help topics. It now offers ways to switch between the Macintosh 1904 and the IBM 1900 date systems; set a default font; or hide the status, scroll, and formula bars.

Excel 2.2 features improved integration with other Microsoft applications. It supports RTF (rich text formatting), which is used by Word 4.0, and the QuickSwitch feature with Word is nothing short of astonishing. With QuickSwitch, charts or cell ranges copied from Excel to Word can be "hot-linked"; when changes are made to the worksheets or charts, they can be automatically updated in Word. This kind of interapplication communication will become commonplace someday — when Apple releases System 7.0



Despite formidable competition, Excel is still the spreadsheet king. Version 2.2 offers eight-color support and finally allows multiple fonts and styles in a worksheet. The 1-megabyte limit has also been overcome, and dozens of new macro commands and other enhancements have been added.

— but Microsoft has implemented a level of integration that goes beyond Apple's plans. For example, under MultiFinder, Word can automatically launch Excel, if it's not already running, to get the changed data. Excel also interfaces with Microsoft Mail, and you can electronically mail an active worksheet or chart by selecting Send Mail from the File menu. (It's not clear yet, though, whether the interapplication abilities of Microsoft's programs will conflict with or complement Apple's

Get Info

Microsoft Excel



List Price: \$395

Published by: Microsoft Corp., 16011 N.E. 36th Way, Redmond, WA 97017; (206) 882-8080.

Version: 2.2

Requires: System 6.0.2 or later; two 800K drives (hard disk recommended).

Compatibility: Mac Plus or later.

Application Size: 728K; Dialog Editor, 26K; Help file, 273K.

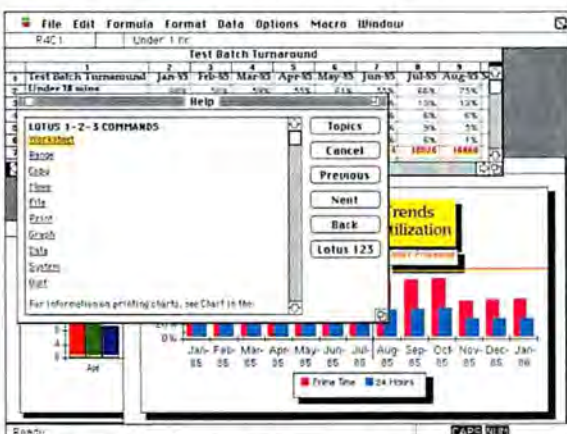
Copy Protection: None

forthcoming System-level approach.)

Excel 2.2 comes with a detailed 700-page reference manual, a 26-page *Quick Reference Guide*, and a 330-page *Functions and Macros* manual. For some reason, the tutorial, *Getting Started with*

roughly comparable. Each of them does one or two things better than the others, but the competition's functionality isn't a great enough improvement over Excel to displace the de facto standard in Mac

Mac. Quartz was a giant technological step over Omnis 3, but it suffered from Windows' slowness and inability to use extended RAM effectively. Omnis 5 is a generation beyond Quartz, and it's not looking back.



Excel's status bar (bottom left) is similar to that of Lotus 1-2-3 for the IBM PC. It displays information messages that offer a first level of help. The more extensive Help dialog box is now accessed from the Window menu, and context-sensitive help is still available. Note the detailed help for 1-2-3 users, which includes a command lookup.

Microsoft Excel, doesn't ship with the upgrade kits, but it is included with the retail edition. And for anyone needing help (regardless of which version you have), there is a 734K HyperCard Guided Tour. The status bar and expanded help function with a glossary make getting started with Excel fairly simple.

HOW IT WORKS Despite the improvements in Excel version 2.2, the program still lacks some of the features offered by its competition. Wingz has some sexier charting capabilities (notably 3-D effects) and supports more colors; Full Impact has an icon bar and wonderful default text colors. Both of these programs have application development and drawing capabilities that Excel lacks. So if these features are what you're looking for, and if you're willing to endure the hassle of file translation and retraining, you may find the competition preferable (see "Fitted Sheets," April '89 and "Wingz Weighs In," June '89). Just be aware that you're going to find more people using Excel than Full Impact and Wingz combined.

The big-three spreadsheets are all

be demonstrably better, and while they are much better than previous versions of Excel, they're only comparable to version 2.2. And for most users, parity isn't enough of an incentive to switch — especially when the package is as stable and bug-free as Excel 2.2 is.

So the fight for the spreadsheet crown has shifted to the marketing front, with Informix selling Wingz to Excel owners for \$99 and Microsoft bundling Excel 2.2 with Word 4.0, PowerPoint 2.01, and Mail 1.37 for \$849 into The Microsoft Office, a sort of "buy two, get two free" promotion (a limited-time offer through

December 31, 1989). But no matter what the outcome of the marketing strategies, Excel — with its huge installed base — is still the king, and version 2.2 goes a long way toward keeping it on the throne.

— Robert R. Wiggins

DATABASES

Omnis 5

Blyth's comeback effort is a terrific developer's toolbox, but it isn't for the average Joe.

OMNIS Anyone who follows the evolution of Macintosh relational-database languages will wonder why Blyth Software skipped from Omnis 3 to Omnis 5. Actually, Omnis 4 was released about two years ago for the Windows environment on IBM PCs under the name Omnis Quartz, but it was never ported to the

WHAT IT IS Omnis 5 is a graphically oriented, multiuser relational/hierarchical-database applications-development environment. As this lengthy description implies, it's a programming language for creating information-management systems, which also means that it's not the first choice for average users. The multiuser and relational/hierarchical aspects are among the features that elevate Omnis 5 above the capabilities of the other contenders in this field.

In multiuser mode, Omnis incorporates record locking into every command that can write to disk, so that multiple users cannot access the same record at the same time and potentially corrupt the data. Omnis 5 has features, such as a read-only file mode, that give further flexibility for multiuser programming.

Relational databases are notoriously clumsy in dealing with transactional data. Hierarchical databases are much more effective in storing and retrieving transactional information, but not all data structures are strictly hierarchical. Business-information systems generally need to be designed around transactions. By combining relational and hierarchical methods, Omnis 5 provides ease of programming and speed of data entry, retrieval, and reporting of complex transactional data.

The Omnis 5 interface has tremendously improved over previous versions. Programmers now have complete control over the size and position of any window (with the ability to span multiple monitors). There are check-box, push-button,

START UP

button-region, and picture fields, as well as the traditional data-entry and display fields. Each window has a draw layer and a field layer similar to the HyperCard model. Each layer is object-oriented with pixel-precise placement of objects and an array of alignment commands. There is full access to fonts, sizes, and styles for

There are commands to launch other Omnis 5 applications, other programs, or DAs from a menu or a button or as a data-entry process.

Omnis has always had a sophisticated report generator, but Omnis 5 has reached new heights of flexibility and performance, including graphics fields, an extending field that expands to accommodate varying

amounts of text up to 32K, and the ability to redefine sort fields (and other report parameters) on the fly from within a procedure.

While many database products claim that they can support an unlimited file size, Omnis 5 is limited to 2.56 gigabytes per data file in ten segments of 256 megabytes. The data file stores the data for up to 60 logical files, each having up to 12 indexes. The segmenting of an Omnis data file allows the data file to

span volumes — a capability no other product has because the others are limited by the size of the storage media. Procedures are limited to 30K each.

Omnis 5 ships with a collection of HyperCard externals that turns HyperCard into a multiuser relational database that simultaneously accesses multiple Omnis 5 data files. Programmers who prefer HyperCard now have full access to the powerful Omnis database engine. These external resources can be used in conjunction with the Oracle HyperCard front end for simultaneous Oracle/Omnis 5 database access. There are no direct links to Oracle without HyperCard.

Omnis 3 was the first Macintosh database program to support Apple's CL/I procedures, and CL/I is built directly into Omnis 5's command set. There are also commands for selecting and configuring a port as well as sending and receiving text, which permits telecommunications to be built into Omnis 5 applications.

Blyth Software's support staff gives competent and timely responses to users' questions. Support is available by telephone or on MacNET. Blyth-authorized training courses are also available.

Omnis 5's documentation shows a marked improvement over previous versions. There is an *Application Designers' Handbook*, a *Programmers' Reference*, and a tutorial called Getting Started. Each is well organized and concise.

HOW IT WORKS It would be impossible for a program of Omnis 5's complexity and power to be perfect, and it isn't — although its flaws aren't major. For example, in an effort to remain completely DOS-compatible, the interface isn't entirely Mac-like: Not every tool palette is given a title bar, you can't easily save a file in a sorted order, and there is no default search interface — you must either design a custom interface beforehand or build one on the fly. But there are also compensations. Unlike 4th Dimension, Omnis 5 lacks a charting function, but it easily calls up Cricket Graph, Excel, or Wingz to access their power.

In short, Omnis 5 is primarily a programming environment more suited to professional developers than to casual users. Programmers of traditional relational-database languages will have a few things to unlearn to take full advantage of Omnis 5's power, but it'll be worth it.

— David Swaine



Omnis 5, Blyth's comeback version of Omnis, is primarily a database-developer's tool. You can create custom menus such as this one (notice the bizarre placement of the Quit command) and a HyperCard-like interface with button regions and icons.

text and fields, and color for all objects. Graphics can be pasted into the draw layer during window design or into picture fields during data entry.

There is a Paste From File command in the Edit menu for text and PICT documents, similar to the Place command in PageMaker. Multiple-window operations are easily programmed.

Get Info

Omnis 5

List Price: \$695

Published by: Blyth Software,
2929 Campus Drive, #425,
San Mateo, CA 94403;
(415) 571-0222.

Version: 1.0

Requires: 1 megabyte; hard
disk and additional RAM
recommended.

Compatibility: Mac II and
MultiFinder.


Application Size: 655K

Copy Protection: None

DESKTOP PUBLISHING

TableTools

The Mac's first dedicated table editor has lots of power — but power isn't everything.

 Until now, making tables on the Mac has been largely a job for spreadsheet applications. TableTools is the first dedicated table editor for the Macintosh that's also compatible with page-layout programs such as PageMaker, Ready,Set,Go!, and QuarkXPress.

WHAT IT IS TableTools sets up tables on a work space that is similar to a page-layout program's. When you launch the program, a 4-x-4-cell table is automatically created. A cell can be formatted as

Text, Graphic, or None, and you can have as many as 127 x 127 cells, depending on your Mac's configuration. (On an SE with 1 megabyte, you can have about 140

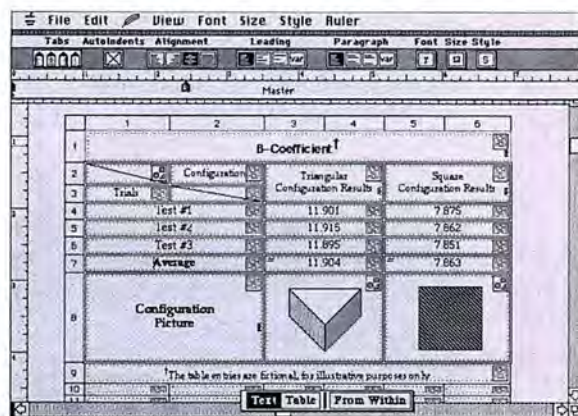
ited and formatted like most spreadsheets, plus it features intercell diagonal lines and fills and the ability to group cells into regions where headers and other oversized elements can be placed. Cells can be set to automatically grow as you enter text.

The Intermediate level adds increased control over text formatting on a ruler with icons for tabs, indents, alignment, leading, paragraph spacing, font, size, and style. Pasteboard rulers and alignment guides allow the precise placement of elements within a table. On the Advanced level, you can set up hierarchical table and text style sheets for controlling regions and text formats. Style books can be copied from one document to another, and tables can be saved as a PICT or Color

modified Key Caps keyboard for entering dingbats, but the keyboard won't go to the rear when you select another window. Furthermore, modifying style sheets in the Style Manager and applying them to your table requires too many steps.

Performance on the Plus or SE is also hampered by the default Text format for cell creation (you really need a Mac II with 2 megabytes for serious editing). In this format, a 7-x-40-cell table requires 276K. The same table shrank to 58K when I formatted it as None, which also reduced the RAM requirements (see Performance table).

Mansfield gets good marks for a methodical manual with good tutorials. Al-



TableTools creates tables in a work space that is similar to that of page-layout programs, featuring familiar pasteboard rulers and ruler icons. The small icons in the upper right corners of each cell show the cell formats. The equal signs (=) in the upper left corners indicate formulas. The palette at the bottom reveals the program's modal operation.

cells; with 2 megabytes, about 1,200.) You can build a table from within TableTools or import text or SYLK files. Importing SYLK files is slow, however (see Performance table). When you import an Excel spreadsheet containing formulas, the formulas are embedded in the TableTools cells and can't be modified. You can, however, apply any of 25 number formats to the values of these cells, which enhances their on-screen and printed appearance.

TableTools is modal in that it operates from linked compartments. You can move between modes by using the Mode palette, menu item, or keyboard equivalent. During intensive editing, this switching can get annoying, especially since TableTools has three modes: Table, in which you edit tables; Text, in which you edit the text in the cells; and a From Within shuttle — a capability like hot links that lets you move between Excel and graphics programs (including MacDraw, Illustrator, and MacPaint).

TableTools' comprehensive editing capabilities are presented on three levels: Beginner, Intermediate, and Advanced. (The program defaults to the Beginner level at startup.) TableTools can be ed-

ited and formatted like most spreadsheets, plus it features intercell diagonal lines and fills and the ability to group cells into regions where headers and other oversized elements can be placed. Cells can be set to automatically grow as you enter text.

HOW IT WORKS TableTools has power, but editing can be cumbersome. The Undo function is inactive for most operations. The Border Line and Diagonal tools are tricky to use, and some elements of TableTools' nonstandard interface are annoying. A Hide/Show dialog box for Edit Settings, for example, lets you pull up a

Performance

	Word 4.0	TableTools 1.0
Matrix size (in Kbytes)	4K	276K (as Text) 58K (as None)
Creation time (empty matrix)	2 sec	48 sec (as Text) 3.8 sec (as None)
Import and build time (SYLK file)	8 sec	97 sec

All timings were conducted on a 5-megabyte Mac II; document size: 7-x-40-cell matrix

though TableTools is a decent first step, it falls short of being the definitive table editor for desktop publishers. Things that would make table editing more palatable — such as built-in charting, tabbing through cells, automatic scrolling on selection, intelligent footnoting, the ability to flip rows and columns, the ability to sort on column or row headers or to edit facing table pages, and a Preferences file for saving user level and edit settings — are missing.

Although TableTools has superior table-manipulation features, it lacks some of the power users need for financial and scientific purposes. If you have an in-house DTP operation creating complex tables, you might consider TableTools. But for simple tables, Word 4.0 is your best bet right now — and, for the same price, Word comes with a word processor to boot.

— Michael Miley

Get Info

TableTools

List Price: \$395
Published by: Mansfield Systems, 550 Hamilton Ave., Suite 150, Palo Alto, CA 94301; (415) 326-0603.

Version: 1.0
Requires: System 6.0.2, hard disk recommended.
Compatibility: All Macs with 1 megabyte.

Application Size: TableTools, 727K; TableFinder, 6K.
Copy Protection: None

RasterOps 24-bit color for MacII & SE/30.

How we broke technology barriers,
to deliver the worlds most advanced 24-bit
color board for just

\$995.

The new RasterOps ColorBoard 264 rewrites the price book for 24-bit color.

Combine it with Apple's® 13" color monitor, or any Mac-compatible 640 x 480 monitor. You get advanced, third-generation 24-bit color, allowing you to display over 300,000 colors simultaneously.

If you have an Apple 13" color monitor, then you are ready for 24-bit color.

If you are going to buy a 13" color monitor, this is the only board you should consider.

Why? For the quality design and features described in this ad.

And for real, 24-bit color.

24-bit systems let you work with over 16 million colors simultaneously. This is the most accurate way to produce true-to-life colors. With 24-bit color, you can display and manipulate photographic quality images, to create stunning presentations and documents.

24-bit color unlocks the potential of desktop publishing, presentations, and video.

Apple's 32-bit QuickDraw™ is the standard.

Now, we have made it affordable.

RasterOps 264 Chip Set

Barrier: Providing professional color capability to Macintosh® users at a price everyone can afford.

Breakthrough: Resulting from many man-years of engineering development time, RasterOps has reduced the large number of components needed (sometimes as many as thirty) to produce 24-bit color video display cards, to a set of two proprietary custom chips utilizing the most advanced VLSI chip design and manufacturing technology. Selecting the most advanced high density CMOS chips throughout, this board has the lowest chip count of any 24-bit card in the industry. The fewer the chips, the less the heat, and the more reliable the product.

SetGamma and DirectSetEntries

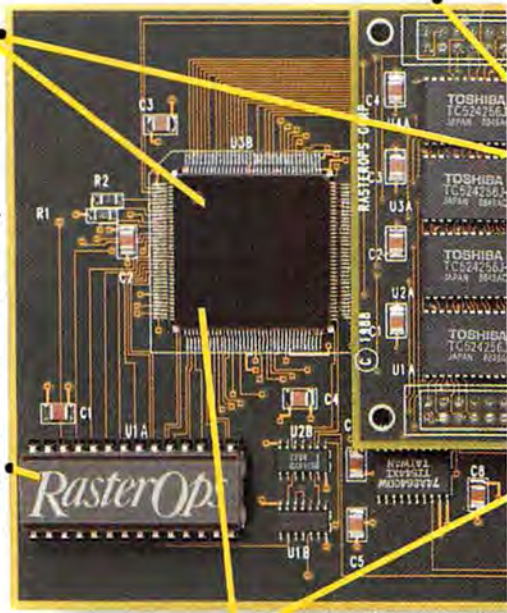
Barrier: To see the effects of color corrections in real time, as you make adjustments to gamma, brightness and contrast.

Breakthrough: Your ColorBoard 264 directly supports Apple's DirectSetEntries and SetGamma QuickDraw instructions in hardware. Instantly see the effect of changes to your color image. You can watch the color tones change as you move the mouse. Without this dynamic support, you have to guess at the color correction, enter the new value, and wait for the new screen to repaint. No waiting with the 264.

300 nanosecond Bus Cycle

Barrier: 24-bit color takes a lot of memory. One screen image can take up to 900,000 bytes. Slow memory slows your screen draw time.

Breakthrough: These 1 Megabit Video RAMs provide more memory in less space, and operate at 100 nanosecond speeds, providing the fastest possible read-write cycles available on the Macintosh, at 300 nanoseconds.



Color Modes

Barrier: The color mode of the display (2, 4, 16, 256, or millions) affects the speed of your work. When you are word processing you want documents to scroll fast.

Breakthrough: With RasterOps' custom Very Large Scale Integration CMOS chips, all color modes are available including 2, 4, 16, 256, or millions of colors. You decide what color level you need and when you need it.

"Millions of Colors For Millions of People!"™



Both the Mac II family and SE/30 version of the RasterOps ColorBoard 264 are fully compatible with Apple's 32-bit Color QuickDraw. RasterOps is an Apple licensed supplier of the Apple 6.0.3 System Software, including 32-bit color QuickDraw. A copy is shipped with each ColorBoard 264.

ColorBoard 264/II For Any
Mac II: \$995.

ColorBoard 264/SE30: \$1295.

All registered and unregistered trademarks are the sole property of their respective companies.

Dual Oscillators

Barrier: With the onrush of multimedia and video applications, our customers don't want to invest in a board that locks them out of video.

Breakthrough: Two separate oscillators. The left to support Apple's 13" color monitor at a resolution of 640 by 480, and the right oscillator to output 8-bit gray scale video directly to VCRs or TV monitors. It will also output RGB NTSC video for external encoding in 24-bit True Color. When you need video, (and it's coming fast), you're ready.

DAC 473

Barrier: Convert a 24-bit image from digital values in memory to analog signals of Red, Green, and Blue, using the least amount of power and board space.

Breakthrough: We are the first to use this advanced, DAC (Digital to Analog Converter) 473. The single, low power chip does a better, faster job, and replaces 3 chips. If you want the best, ask for the DAC 473.

SMOBC Fabrication

Barrier: The accepted, easy way to manufacture a board is wave soldering. But this doesn't allow efficient use of robots, and doesn't create a "Clean" board.

Breakthrough: We use an advanced, Solder Mask Over Bare Copper board fabrication technology and surface mounting of components through efficient, dependable robotics. Note the clean, simple appearance of this board. When you turn the board over, you will see a smooth golden surface, the trademark of a SMOBC board. It costs more and requires a greater design effort, but the benefit to you is a more reliable board.

Auto Sensoring

Barrier: Allow user to change monitors and frequency without setting a switch, changing an oscillator, or making a selection from the control panel.

Breakthrough: Circuitry that automatically senses which monitor you are using and switches automatically from 66.7 Hz to 30 Hz. You just plug in your Apple-compatible monitors, the board will take care of the necessary adjustments.

Bus Buffering

Barrier: The NuBus transmits power spikes and bus noise. These can destroy data as well as circuitry on the display card. Spikes can also cause pixels to trip, causing spots on the screen.

Breakthrough: We designed sophisticated bus buffering circuitry to isolate the hostile NuBus environment from critical components on the board, protecting your video investment, and your data.

Power Draw

Barrier: Power and heat. Your board draws its power through the NuBus. Apple specifies a maximum of 2.1 Amps per slot. Many boards require over 4.0 Amps. Amps mean heat, which is deleterious to your Macintosh, and a drain on the power supply.

Breakthrough: Through the extensive use of CMOS circuits, VLSI parts that replace multiple parts, low chip count, and 5 mil copper traces, the RasterOps ColorBoard 264 needs less than 1.0 Amp. Your system runs cooler. You can use other slots without fear of overloading your power supply.

RasterOps
Literature
Package

For your nearest dealer and literature on the most advanced Macintosh graphics products, call:
Information Hotline:
1-800-952-6300.
Dept. X34.

RasterOps

AUSTRIA - Power Publish - (1) 50 56 411, AUSTRIA - Mitsui - (2) 452 0452, BELGIUM - Databeher - (02) 569 65 94 - Megatek - (41) 52 08 69, DENMARK - Internac - (2) 80 04 22 - JAI - (2) 91 88 88, FINLAND - Top Computer Technologies - (9) 0 452 2188, FRANCE - Megatek - (1) 34 19 83 71, W. GERMANY - Magirus - (0711) 72 81 60, GREECE - L-Cube - (1) 36 14 509, HOLLAND - Positronika - (040) 41 63 55, ITALY - Infograf - (02) 9522 724, JAPAN - Nihon Binary - (03) 407 9751, Marubeni - (03) 507 4523, NORWAY - Software Plus - (02) 39 46 96, PORTUGAL - MacIndex Informatica - (39) 21221, SINGAPORE - Chartered Electronics Ind - 779 7621, SPAIN - HSC - (91) 255 79 00, SWEDEN - Software Plus - (11) 18 12 70, SWITZERLAND - Comac - (056) 20 13 55, U.A.E. - Arab Business Machines - (971) 4233 438, UK - Gomark Limited - (01) 731 7930.

Make the Optimal Choice.

Just look at a few of the many reasons that make the Optima Series an unbeatable value:

- Not a kit - All products are fully assembled & tested.
- Our drives come preformatted and have been tested for 72 hours. Beware of other manufacturers who make you do the testing!
- Precision engineering & stringent quality control allow us to offer a full 2 year warranty.
- 30 day moneyback guarantee - No questions asked.
- Flexible internal models let you keep your SE's second floppy or return it for a \$50 rebate. Adding an Optima 31 hard disk can cost as little as \$349!

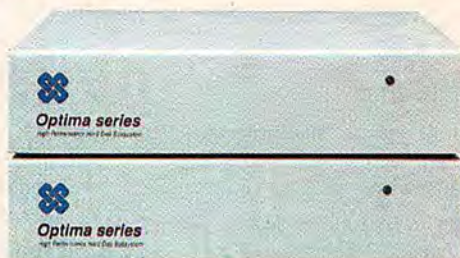
New!!!

**\$699 OptiView
Full Page Display
for Mac SE. Call
for details.**



**OPTIMAL
TECHNOLOGY** CORP.

650 Main Street Amherst, MA 01002
(413) 256-1257 (413) 256-1258



Ready to run!
All necessary cables
and software included

Optimal Drives --

Choose our easy to install internal models or our attractive external models. We're so confident you'll find them to be the fastest, quietest, and best drives available that we guarantee it with our no questions asked return policy!

New Low Prices!!!

	Internal	External
Optima 31 (28 ms Seagate)	\$399	\$499
Optima 40 (12 ms Quantum)	\$549	\$649
Optima 48 (28 ms Seagate)	\$499	\$599
Optima 80 (12 ms Quantum)	\$819	\$919
1 Meg SIMMs	\$179	(Call for Current Price)

Call (800) 637-0088



Prices include UPS ground shipping; call for expedited shipping costs. No surcharge for Visa and MasterCard. Massachusetts residents add 5% sales tax. Call for purchase order pricing and terms. Technical support telephone number provided with the purchase of all products. Prices, specifications, and policy subject to change without notice. Optima, Optima 31, Optima 40, Optima 48, and Optima 80 are trademarks of Optimal Technology Corp.

Please circle 78 on reader service card.

BOLDLY GO WHERE NO MAC HAS GONE BEFORE

Macintosh® users can finally choose from the thousands of software programs only available for the PC.

With SoftPC®

The only software package that brings true MS-DOS® compatibility to a Mac II, IIX, or 68020-accelerated SE.

SoftPC enables you to run all the PC best-sellers - Lotus® 1-2-3®, WordPerfect®, etc. - on the Mac. And those PC programs developed in-house for special purposes.

You can even use PC and Mac programs at the same time, thanks to SoftPC and Apple's MultiFinder™. Copy and paste between PC to Macintosh applications.

And when you finish, all information can be stored on the same Macintosh hard disk.

THERE'S NO REASON TO BE AFRAID

No boards... No hassles... SoftPC is easy to install and upgrade. Just like you'd expect from any Macintosh application. Double-click. That's it.

SEEING IS BELIEVING

Don't take our word for it. Visit the nearest computer dealer and ask for a demonstration of SoftPC. SoftPC will open a whole new universe for you.

To find the dealer closest to you, call 800-848-7677.

Insignia

Insignia Solutions Inc.,
254 Germain Way
Sunnyvale,
California 94086
Tel: (408) 522-7600
FAX: (408) 733-9541

™ trademarks and ® registered trademarks of their respective companies



**VERSION 1.3 NOW SHIPPING
NEW LOW PRICE - \$399
"BEST NEW CONNECTIVITY PRODUCT"
FOURTH ANNUAL MACUSER'S EDITOR'S CHOICE AWARDS
HONORABLE MENTION**

Please circle 88 on reader service card.

ACCOUNTING

Business Sense

Monogram's latest version of this integrated business-accounting package is an excellent effort on the verge of greatness.

§ The latest business-accounting product to enter the already overcrowded fray is Business Sense from Monogram Software, publisher of Dollars & Sense, a

employees and more than \$5 million in sales shouldn't even consider Business Sense, because it can't handle the data volume of larger businesses. Despite that caveat,

Business Sense offers many features and functions that its competitors lack and is clearly a winning low-cost small-business system.

WHAT IT IS Business Sense is a fully integrated accounting system. When you update the accounts-receivable module, all changes that have to flow to the general-ledger system do so automatically. Automatic integration is a plus as long as you can operate your entire accounting system on one Mac. If

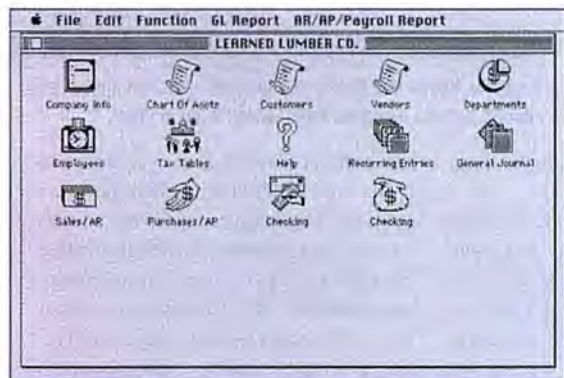
to the program. The first level prevents users from accessing payroll, company information, account histories, and income statements. The second level yields unrestricted access.

Account numbers are four digits long, with a trailing eight-digit subaccount number, which makes it simple to assign accounts for reporting purposes. Unfortunately, all the reports in Business Sense are hard-coded. If you want ad hoc reporting capabilities, you have to export data to a spreadsheet (in either SYLK or ASCII format).

The accounts-receivable module provides detailed customer histories, credit-limit warnings, and automatic generation of credit memos. Finance charges and discount schedules are easily set up and automatically calculated.

An important feature of Business Sense is that it can readily track partial payments against open invoices and can account for sales commissions for up to 2,000 salesmen. A full aging subsystem generates aging reports by customer.

The accounts-payable system tracks the invoice date, due date, and discount date for all open invoices. Details for generating an aging analysis for cash-flow planning are automatically tracked — an important feature for small businesses that aren't cash-rich. And instead of trying to fool the payroll system into paying independent contractors, you can use the accounts-payable module. This module also produces the IRS-required 1099 form.



Business Sense's main screen shows all the modules of this excellent integrated business-accounting package.

popular home financial-management program. Established programs such as Plains and Simple (from Great Plains), Rags to Riches (from Chang Labs), and Simply Accounting (which Bedford Software recently sold to Computer Associates) have been available for some time. Business Sense differentiates itself from these other full-function packages (which include the following modules: general ledger; accounts receivable; accounts payable; and, in the case of Simply Accounting, payroll) by offering the user all the functions on one disk — the ease-of-use approach.

Most of Business Sense's limitations are well above the concern horizon of the kinds of businesses that should use it. The recommended number of employees, customer accounts, and vendors Business Sense can handle is 2,000 each, and it can handle checks of up to \$1 trillion. Any business that has more than 50 em-

you have several clerks doing your accounting, the system can't be split up. Business Sense is also not designed for network operation or for subsystem consolidations — everything has to be on the same machine.

The general-ledger module manages multiple companies, but it can't consolidate them. Each company can have up to 99 departments and five bank accounts (which may be a limitation for some users).

Recurring entries such as rent and lease payments are easy to set up and are automatically posted to the system, based on user-specified dates. The system also provides a full audit-trail capability and supports reversing entries.

Twelve months can be kept open, but Business Sense runs only on a calendar-month basis. It doesn't support flexible month ends.

Only two levels of security are built in

Get Info

Business Sense

List Price: \$495

Published by: Monogram Software, 531 Van Ness Ave., Torrance, CA 90501; (213) 533-5120.

Version: 1.2

Requires: Two 800K drives or hard disk.

Compatibility: 512KE or later.

Application Size: 256K

Copy Protection: None

BetaWatch

Products on the Horizon

68000 Sweden has announced TeleServe, a customizable answering machine that even makes your coffee. It connects to a dedicated Mac and records messages in the SND format (for voice mail) or queries the caller for database input. Because TeleServe has a parallel

port with eight inputs and outputs, you can connect a coffee machine to an optional interface box and phone ahead for a fresh pot. TeleServe comes with a HyperCard front end, and 68000 says that experienced HyperTalk programmers

can create custom voice-mail systems in about an hour. A developer's kit with source code for interfaces to 4th Dimension, HyperCard, Lightspeed Pascal, LightspeedC, and MPW is expected soon.

**68000 Sweden, Glanten 75183, Uppsala, Sweden; 46 18 680000.
List Price: Less than \$2,000.
ETA: Summer 1989.**

Wallaby's Laptop System is an add-on for Pluses and SEs. It uses 128K ROMs transplanted from the Mac, a card that installs in the gutted Mac, and a cable that links the two machines. When the computers are connected, the processor runs twice as fast as your original Mac's. There is also a 1.4-megabyte floppy drive and a second 640-x-400-pixel, back-lit liquid-crystal-display screen. The Wallaby folds into a battery-operated portable with a footprint slightly larger than a standard sheet of paper and weighs less than nine pounds. Since the ROMs are installed in the Wallaby, your Plus or SE is unusable until the ROMs are reinstalled.

**Wallaby Systems, 2540 Frontier Ave., Suite 109, Boulder, CO 80301; (303) 444-4806.
List Price: \$2,995.
ETA: First quarter 1990.**

The payroll module can accommodate up to ten withholding categories and ten wage categories, plus tips and fringes. Any form of state or city tax can be accommodated. Full federal W-2 reporting as well as 914 reporting is supported. Using the receivables module, you can even track cash advances to your employees.

Stacked on top of the four main modules is a built-in budgeting system that tracks actual expenditures in relation to forecast amounts in either tabular or graphic form. Budget reporting can be done for individual cost centers, for aggregations, or on a consolidated basis. Almost any report can be viewed graphically over any time span within the fiscal year that you specify.

HOW IT WORKS Business Sense fully exploits the Mac interface. You open each module in its own window, and each time you close a window, all the transactions are automatically posted. By clicking on information such as an account number in one window, you can easily move that data to another window, and hence another module, without retyping.

Business Sense has powerful productivity functions such as lookups of partial names and account numbers built into the program. In addition, the program's Find feature locates accounts, descriptions, and amounts in any journal or report.

As you would expect, Business Sense generates mailing labels and can export any of its files to another application.

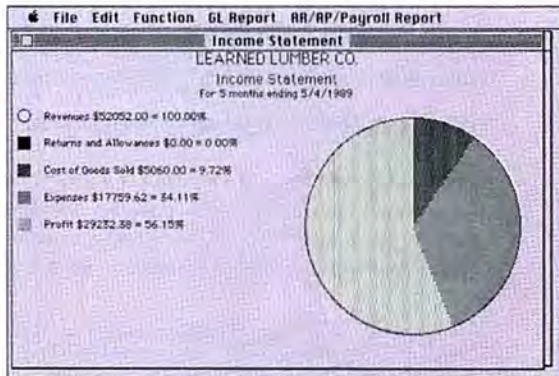
Starting the program is straightforward. A sample chart of accounts can be easily modified. Setting up accounts is simple, thanks to excellent use of the Mac interface and to the step-by-step, easy-to-read printed documentation. A simple Help file is kept on-line, and it can be edited to accommodate company policies and procedures if necessary.

Full error-checking routines are incorporated into the entry screens. Error checking applies to entries that are out of balance, nonexistent accounts, posts to summary account, deletion of active accounts,

adjusted closed invoices, credit limits, and missing tax tables for payroll.

The system does not offer incremental-backup capability; backups of all data files are necessary.

Business Sense has the potential to set



Business Sense can give you a graphic view for almost any report, across any time span within a fiscal year.

new standards for ease of use, documentation, and functionality with the inclusion of a few significant enhancements, such as customizable reports, more-flexible data-security options, improved audit trails, and the ability to consolidate companies. Business Sense is smooth and fast and is clearly worth consideration by both novice business accountants and experienced bookkeepers.

— Ken Landis

DESKTOP PUBLISHING

SmartForm Designer

This is a handy tool for in-house production but not yet for professional use.

A few years ago, I was a forms designer for a small insurance company, and my only forms-composition equipment was a typewriter and an Apple III. Claris' SmartForm Designer would have been a godsend in that situation. But

Overnight \$3

Specials good through
September 30, 1989

Now Toll-Free
In Canada
1-800-344-7753

Monday thru Friday
9 a.m. - 9 p.m.
(Eastern Time)

Saturday
9 a.m. - 6 p.m.
(Eastern Time)

**30 DAY
MONEY-BACK
GUARANTEE
ON SELECTED
PRODUCTS, CALL
FOR DETAILS**

Adobe Illustrator 88 by Adobe Systems

Best of the best... Best business application... Best graphics in a graphics program... SPA Awards, 1988. **Adobe Illustrator 88**, the most precise drawing and illustration tool ever created for your Macintosh. And, for a limited time, you'll also get a free copy of Adobe Collector's Edition Vol. 1 - a \$125 value. Do it fast and save yourself a bundle. **\$299.**



HYPERMEDIA & LANGUAGES

Beacon Technology		Olduvai Corporation Plus 1.1	109.
HyperBible King James	149.	Smethers & Barnes	
HyperBible International	179.	Protolyper	129.
Borland Turbo Pascal	68.	Symantec Lightspeed C	165.
Bright Star Technology		Lightspeed Pascal	95.
Hyper Animator	109.	Just Enough Pascal	49.
Consular Mac 68000 Dev. System	57.	TENpointO FocalPoint II	119.
Digital, Inc. Smalltalk/vmac	129.	Trendware Corporation Stack Cleaner	29.
Hyper Press Script Expert	46.	HyperTools 1 or 2	58.
Manx Aztec C	65.	T.M.L.	
Aztec C + SDB	99.	TML Pascal II V3.0	115.
Aztec C + MPW	99.	TML Source Code Library II	42.
Microsoft Quick Basic	65.	Zedcore ZBasic 5.0	99.

Quicken 1.5 by Intuit

Forget financial hassles with **Quicken**, the world's #1 selling finance software. It's the absolute fastest, easiest way to do your personal or small business bookkeeping. **Quicken** slashes the time you spend on your finances by automating all your routine financial tasks, from printing recurring checks without typing, to providing detailed tax deduction summaries instantaneously.

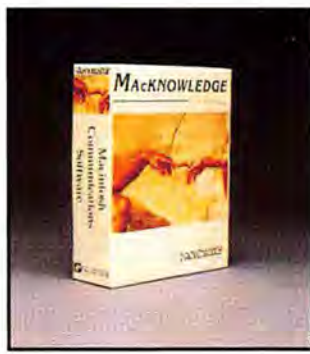


BLANK MEDIA

Single Sided 3 1/2" Diskettes		Centech 3 1/2" DS/DD Color Disks (10)	19.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	14.	Sony 3 1/2" DS/DD Disks (box of 10)	16.
Double Sided 3 1/2" Diskettes		Maxell 3 1/2" DS/DD Disks (box of 10)	17.
BASF 3 1/2" DS/DD (box of 10)	15.	Verbatim 3 1/2" DS/DD Disks (box of 10)	17.
Bulk (Sony) 3 1/2" DS/DD (10)	17.	3M 3 1/2" DS/DD Disks (box of 10)	20.

MacKNOWLEDGE by Prometheus

MacKNOWLEDGE is the latest communications software available for your Mac. Icon based scripts provide instant access to all major online services with just a click of your mouse. The TAL scripting language provides all the capabilities for customizing and automating your own online sessions or the record function will watch your session and create an icon based script automatically. **\$125.**



Insight Expert Accounting Series by Layered Inc.

A series of stand-alone or fully integrated accounting modules for general ledger, accounts receivable w/billing, accounts payable, payroll, inventory control and time billing which gives you answers, advice and analysis. Now includes **Data Import!** **\$409.**



WORD PROCESSORS & DESKTOP PUBLISHING

Access Technology Mind Write 2.0	95.	Letra Studio	289.
Mind Write Express	129.	LetraFonts (Various Vol. 1-45 ea.)	65.
Aegis Showcase F/X	199.	Microsoft Microsoft Word 4.0	255.
Allan Bonadio Associates		Niles & Associates EndLink	59.
Expressionist 2.0	79.	EndNote	82.
Aldus Corporation Aldus Persuasion	385.	Paragon Concepts Nisus	259.
PageMaker 3.0	389.	Preferred Publishers	
Ashton Tate		Vantage	Special 59.
FullWrite Professional	265.	Quark, Inc.	
Broderbund DTP Advisor	47.	QuarkXPress V2.0	499.
Caere Omnipage	559.	QuarkStyle	189.
Claris MacWrite II	185.	Symantec More II	255.
Design Science		Symmetry Acta Advantage	65.
Math Type 2.0	99.	T/Maker Company	
Emerald City Smart Art	Special 89.	WriteNow V2.0	Special 109.
Exodus Expresswrite	65.	U.S. MicroLabs Font Sizer	79.
Letraset		Word Perfect Corporation	
Design Studio 1	459.	Word Perfect	179.
Ready, Set, Go! 4.5	275.	Working Software QuickLetter	75.

CanOpener by Abbott Systems

CanOpener is the information retrieval utility for the Mac. It will search and retrieve text, pictures and sounds from just about anywhere. Which means you can extract information from almost any document, even if you don't have the application. Or, recover data from corrupted files. And **CanOpener** will scan disks, hard drives and networks to locate missing information! **\$65.**



**PROGRAMS
PLUS**

FAX: 203/381-9043
Inquiries: 203/378-3662
Canada: 1/800/344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497
1/800/832-3201

Please circle 62 on reader service card.

Positively A Plus

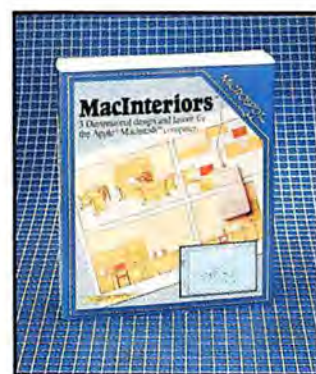
PixelPaint Professional by SuperMac Software

PixelPaint Professional is the first "true-color" paint program for the Macintosh. It is designed to grow with you — from 8-bit to 32-bit systems. From general painting to advanced design, **PixelPaint Professional** gives you the intuitive tools to do your work easily. Use powerful features like advanced masking, fill effects, dithering, anti-aliasing and transparency control for advanced graphics effects and photographic-quality images.



ACCESSORIES

Advanced Gravis		Printer Muffler Stand (80 & 132)	24.
MouseStick (Plus or ADB)	Special 85.	Printer Muffler 80	43.
Cutting Edge		System Saver Mac	
Cutting Edge MCK-105QK		(Beige or Platinum)	64.
Keyboard w/Quickkeys	135.	Space Saver Printer Stand	17.
DataDesk		Super Base	34.
MAC-101 Keyboard/Beige		System Saver SE	52.
(128k/512k & MacPlus)	Special 145.	Masterpiece Mac II	105.
MAC-101 ADB Keyboard/Platinum		New Turbo Mouse (Reg. or ADB)	109.
(Mac SE & Mac II)	Special 145.	Universal Copy Stand	22.
Ergotron Mousecleaner 360°	15.	Universal Printer Stand	15.
MacTilt (Mac, SE or II)	68.		
Muzzle SE	62.	Lynx Computer	
Muzzle Mac II	69.	Lynx Trackball (Mac & Mac+ or	
Farallon MacRecorder Sound System		Mac SE & Mac II)	Special 65.
(Mac SE or Mac II)	165.	Mobius Fanny Mac QT	
Goldstein & Blair		(Beige or Platinum)	60.
Macintosh Bible 2nd ed.	20.	Mouse Systems A+ Mouse (MacPlus)	65.
Impulse Audio Digitizer w/soundware	139.	A+ ADB Mouse	
I/O Design		(Mac SE/Mac II)	85.
Mac Luggage in Navy or Plat.		Moustrak	
Macinware Plus Carrying Case	64.	MousePad 7" x 9" Size	8.
Macinware SE Carrying Case	Special 75.	MousePad 9" x 11" Size	9.
Imageware II Carrying Case	49.	Orange Micro Grappler Spooler	39.
Kalmar Designs		Grappler C/Mac/GS or Alphabits	79.
Teakwood Roll-Top Disk Cases:		Grappler L/Q or Grappler L/S	103.
Micro Cabinet (holds 45 disks)	14.	Ribbons	
Double Micro Cabinet		Available in Black, Blue, Brown,	
(holds 90 disks)	21.	Green, Orange, Purple, Red,	
Triple Micro Cabinet		Yellow, Silver & Gold	
(holds 135 disks)	31.	ImageWriter Ribbon	4.
Kensington		ImageWriter Black 6-pack	20.
Mouseway (Mousepad)	8.	ImageWriter Rainbow Pack	
ImageWriter or ImageWriter II Cover	9.	(6 Colors)	20.
Macintosh Plus/SE Dust Cover	9.	ImageWriter II-Four Color Ribbon	9.
Apple Security Kit	34.	ImageWriter LQ Black	17.
Antiglare Polarizing Filter	33.	ImageWriter LQ Four Color	20.
Mac II Stand and Cable Kit	65.	Seikosha Ribbon Black	6.
Mac II Monitor Stand	65.	Targus	
Power Tree Surge Suppressors		ImageWriter II Carry Case Blk.	49.
(10, 20, or 50)	Call	Macintosh Plus Carry Case Blk.	59.
		Deluxe MacPlus-XKB Blk.	75.



MacInteriors by Micro Spot

MacInteriors is for all of us who have ever wanted to do our own interior design. Now for the price of a typical 2D package you can have 3D space-planning software that let's you work and examine creations in several views (inc. perspective and bird's-eye), then print it out to a laser printer or plotter. You can create your own objects or use the ones provided. Soon you'll be designing everything from bedrooms to buildings. **\$199.**



Flipper 44 & Integra HDs by Dolphin Systems

Dolphin Subsystems are truly the intelligent choice for Macintosh mass storage. Choose from fast **Integra** hard disks 20-80mb or **Flipper 44** (\$1139) which offers unlimited storage with 44mb removable 25ms hard disk cartridges.

Visit Us In The Electronic Mall™
On CompuServe - GO **PP** PROGRAMS L U S



Vantage by Preferred Publishers

Vantage is a powerful, special purpose text processor designed to respond to both the specialized and the mundane word processing tasks. **Vantage** can convert a wide variety of different word processing formats including Word, MacWrite and Write Now. . . **\$59.**

OUR POLICY

- ★ VISA and MASTERCARD accepted. No surcharge.
- ★ Your credit card is not charged until we ship.
- ★ If we must ship a partial order, the shipment that completes the order is sent freight free.
- ★ All shipments insured; no additional charge.
- ★ Upon receipt and approval, personal and company checks now clear the same day for immediate shipment.
- ★ No sales tax except orders shipped within CT, add 8% tax.
- ★ COD maximum \$1000, cash or certified check.
- ★ 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. Prices subject to change without notice. All items subject to availability.
- ★ Call us anytime Monday thru Friday 9:00 to 9:00 Eastern Time, or Saturday 9:00 to 6:00 Eastern Time. You can call our business offices Monday thru Friday 9:00 to 5:30 Eastern Time at (203)375-3560.
- ★ Purchase Orders accepted at our discretion, for more information call (203)378-1926, 9:00 to 5:30 Eastern Time.

SHIPPING

- ★ **Continental U.S.:** Add \$3.00 per order to cover Airborne Express Overnight, unless UPS ground delivers next day. Some areas require an additional day.
- ★ All (instock items) ordered by 6:00PM Eastern Time Monday thru Friday will ship that evening. Barring computer failures or other catastrophes.
- ★ **Alaska, Hawaii, outside Continental U.S., APO and FPO;** call (203)378-3662 or write for shipping information.
- ★ Mail-in orders (especially from foreign countries), please furnish telephone or fax number.

Overnight \$3



MacPrint 1.1 by Insight Development

Introducing **MacPrint 1.1**, an easy-to-use software package that lets you use virtually any Mac application on alternative printers. Including HP LaserJet+, series II, IID and compatibles and the HP DeskJet and DeskJet Plus. Use **MacPrint 1.1** for true WYSIWYG performance. Four Compugraphic font families are included with point sizes from 9 to 96. Completely transparent after installation. **\$79.**

DISK DRIVES/HARD DISKS/UPGRADES

1 Meg SIMMS	Call	MacSnap 548S	
CMS		(512E to 2MB w/SCSI)	Special 499.
SD Ser. MacStack SD20 (Mac+/SE/II)	555.	MacSnap Plus 2 (MacPlus to	
SD Ser. MacStack SD30 (Mac+/SE/II)	595.	2MB Non Expandable)	Special 312.
SD Ser. MacStack SD43 (Mac+/SE/II)	785.	MacSnap 2SE or 1024 Option	
Cutting Edge Cutting Edge 800k Drive	149.	(1MB or MacII Memory Exp.)	Special 312.
Under The Mac 20	439.	SCSI Interface/Port	109.
Under The Mac 30	499.	Everex EMAC-40IMP Plus	789.
Under The Mac 40	599.	EMAC-60IMP	869.



Casino Master by Centron

Casino Master Deluxe Version is an integrated package of five casino games in dazzling color; runs on Mac II, IIx and IIcx. Play Blackjack, Craps, Roulette, Video Poker and Baccarat. All games have mouse-controlled betting, long-term storage of wins/losses. Complete manuals include rules, strategy. Standard version has same features, runs on all Mac's with 512K. **\$55.**

Dolphin Systems		Mobius Technologies	
Flipper 44	Special 1139.	MultiScreen Video Card	349.
Integra Series 20-80	Special Call	Personal Computer Peripherals	
Dove Computer		Platinum Color. Optional Built-In Modems.	
Marathon 030 Accelerator	999.	MacBottom HD-45	
MSE 4 (16 Mhz w/1MB & Math Chip)	1159.	(45MB SCSI Hard Disk)	789.
MacSnap 524E (512E to 1MB)	Special 187.	MacBottom HD-70	
MacSnap 524S (512E to 1MB w/SCSI)	Special 249.	(70MB SCSI Hard Disk)	999.
MacSnap 548 (512K to 2MB)	449.	MacBottom HD 84 (84 MB SCSI HD)	1249.
MacSnap 548E (512E to 2MB)	Special 549.	Video Technology	
		Laser 800k External Drive	185.



LYNX Trackball by LYNX Computer

The attractive, easy-to-use **LYNX Trackball** offers you precise fingertip cursor control at an affordable price in a sleek desktop profile. A patented high-technology encoder which is also used in sophisticated aerospace applications assures built-in quality. It is ideal for desktop publishing, CAD/CAM and graphics. Available for all Mac and Apple models. It offers you twice the speed, twice the accuracy at half the price. **\$65.**

ENTERTAINMENT SOFTWARE

Access		Infocom	
World Class Leader Board Golf	28.	Leather Goddesses of Phobos	15.
Accolade		Beyond Zork or Hitchhiker's Guide	15.
Hard Ball or Mean 18	27.	Zork Trilogy or QuaterStaff	30.
4th & Inches	27.	Zork Zero	35.
Cosmic Osmo	35.	MicroPro Pirates	32.
Activision		Microsoft Flight Simulator 1.02	32.
Universal Military Simulator or Manhole	30.	Miles Computing Inc.	
Manhole CD ROM	35.	Harrier Strike Mission II or	
Might and Magic	36.	The Fool's Errand	32.
Broderbund		Puzzle Gallery	32.
Ancient Art of War or At Sea	27.	Mindscape	
ShufflePuck Cafe	24.	Balance of Power 1990 or	
SimCity	27.	Crossword Magic	30.
Bullseye Software		Deja Vu or Deja Vu II	30.
P51 Mustang or Ferrari Grand Prix	32.	King Of Chicago or Shadowgate	30.



MouseStick by Advanced Gravis

The **Gravis MouseStick**, the ultimate in precision, versatility and durability, ideal for CAD, graphics, DTP and entertainment software. For serious work or serious play, the **Gravis MouseStick** isn't mousing around! Available in Plus and ADB versions. **\$85.**

Casady & Greene, Inc.		Defender of the Crown, Colony or The Uninvited	30.
Crystal Quest	26.	Practical Computer Applications	
Crystal Quest w/Critter Editor	42.	MacGolf or Lunar Rescue	35.
Centron		MacCourses	29.
Crapsmaster, Roulettemaster or BlackJack Ace	27.	Road Racer	39.
Pokemaster or Baccaratmaster	27.	Mac Golf Classics	54.
Casino Master	49.	Primera Smash Hit Racquetball II	19.
Casino Master (Mac II)	Special 55.	Sierra On-Line	
Data East Super Hang On	27.	Leisure Suit Larry	23.
Discovery Software		Space Quest or Space Quest II	29.
Arkanoïd	27.	Police Quest	29.
Electronic Arts		Silicon Beach Software	
ChessMaster 2100 or		Dark Castle or Apache Strike	32.
Hunt for Red October	32.	Beyond Dark Castle	32.
Chuck Yeager Flight Simulator or Life & Death	32.	Sir-Tech Mac Wizardry	35.
Starflight I	36.	SoftStream, Inc. Colour Billiards	35.
One-On-One, Pinball Construction Set, Seven Cities of Gold, SkyFox, or Patton vs Rommel	15.	Mac Man or Solitaire DA	23.
EPYX		Sphere, Inc. Tetris	20.
Sub Battle Simulator (Mac or MacII)	29.	GATO, Orbiter or PI-109	26.
Hayden Software		Solitaire Royale	20.
Sargon IV	29.	Falcon 2.0	32.
Hyper Press Silver Screen	42.	Springboard Hidden Agenda	36.
		SubLogic Jet	32.
		Toyogo, Inc. Go Master	49.
		Joseki Tutor	30.



Calendar Creator Version 1.0 by Power Up

Calendar Creator lets you create and maintain custom calendars for all your needs. You can work with your actual calendar on screen and keep several event lists for activities including appointments, deadlines, birthdays and recurring meetings. **\$38.**



FAX: 203/381-9043
Inquiries: 203/378-3662
Canada: 1/800/344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497
1/800/832-3201

now that I typeset forms, my ideal forms package must match extremely precise specifications. SmartForm Designer doesn't come close to the versatility or precision of professional typesetting equipment, but if you're currently creating forms with packages such as Excel or MacDraw II, SmartForm Designer may be the powerful drawing tool you've always needed.

SmartForm comes with a pleasant and

WHAT IT IS SmartForm Designer creates forms one element at a time; you assemble a complete form from adjacent or layered boxes and rules. The program is essentially a drawing kit optimized for the special requirements of designing and composing custom business forms. The drawing Tool Kit contains the usual line-drawing and shape-creating tools, with a few appropriate additions for creating grids, combs (the toothy fields you often

use for filling in Social Security numbers, for example), and data fields. Elements can be positioned freehand, or, more usefully, the components can snap to a user-definable grid. The grid's vertical and horizontal line spacings can be specified independently in standard forms increments (1/6 inch, 1/8 inch, 1/12 inch, 1/20 inch, or true picas, among others). PICT files can be imported and scaled to fit as needed.

SmartForm's companion program, SmartForm Assistant,

lets your document serve as a data-gathering screen-entry form, but this function stops short of being an interface for a true relational database. It's really just an automated information-gathering system, best suited to small offices, where everyone might be expected to know the electronic-forms procedures by osmosis.

LIMITATIONS In a commercial forms-typesetting environment, I couldn't consider SmartForm as my only forms-composition tool. I have to be able to match design specifications, and short of scanning the whole thing in, it's difficult to make a SmartForm that closely matches a form created elsewhere. Professional forms design requires a more flexible grid and better control over text and graphic positioning. Even SmartForm's line tool is limited. SmartForm provides for 1/4-point, 1/2-point, and thicker rules in whole-point increments, but my customers often need 1 1/2-point rules.

Also missing are word-processing features of any consequence. Type sizes and leading can be fine-tuned nicely, but SmartForm assumes that your text re-

quirements are limited mostly to captions or short instructional paragraphs. It doesn't provide an appropriate environment for composing a text-intensive form letter, nor does it support kerning.

SmartForm's specification display precisely shows the position and dimensions of selected rules and boxes. Perhaps the program's greatest strength — barely hinted at in the tutorial or documentation — is that you can forgo the mouse and alter selected items by typing their measurements directly into the specifications display. Even this feature falls short, however: It lets you modify the dimensions of a box but doesn't provide a means to reposition the box without distorting it. Repositioning requires use of the mouse or the Alignment menu.

If you're a professional looking for a better tool, this isn't it. But if you currently design your forms with a spreadsheet or object-oriented program, SmartForm Designer will probably save you some time.

— Jay Zilber



With SmartForm Designer, you create forms one element at a time, using the tools on the palette. The Specs box lets you precisely alter the dimensions of a box, but you can't reposition a box without distorting it.

well-paced HyperCard tutorial that guides you through a series of forms-design sessions. Extensively hands-on at first, it anticipates the user's impatience, gradually assuming more of the work itself and wrapping things up just as the user's attention span is likely to have expired. What's missing is a short crash course in forms design and analysis. SmartForm does little to prevent you from designing an illogical or badly arranged form.

This shortcoming is partly offset by a third-party library of commonly used pre-designed forms. Packaged under the name FLEXFORM Business Templates, it contains a wide assortment of well-designed general business forms that can be customized to suit the user's individual requirements. Major modifications may prove nerve-racking, because it's difficult to dismantle and reassemble these templates without knowing how the original designer pieced together the various fields and sections. But if you only want to use the forms without customizing them, you can use FLEXFORM with SmartForm Assistant.

Get Info

SmartForm Designer 1 1/2

List Price: \$399
Published by: Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052-8168; (408) 987-7000.
Version: 1.0
Requires: System 6.0 or later.
Compatibility: Mac Plus or later. Hard disk recommended.
Application Size: 696K
Copy Protection: None

FLEXFORM Business Templates 1 1/2

List Price: \$89.95 per volume
Published by: Antic Software, 544 Second St., San Francisco, CA 94107; (415) 957-0886.
Requires: System 6.0 or later. Hard disk recommended.
Includes: SmartForm Assistant.
Compatibility: Mac Plus or later.
Copy Protection: None

MicroPhone II version 3.0

A "Stunning" Achievement in Software Engineering

The software that takes the hassle out of telecommunications. Like a finely crafted European touring sedan, MicroPhone II offers you unsurpassed power and allows you to communicate with style and agility.

Here are seven reasons why, if you're serious about telecommunications, you should consider owning MicroPhone II:

POWER TRAIN. MicroPhone II is charged by the most powerful scripting engine for telecommunications, offering variables, string and math functions, arrays and file manipulation. You develop scripts with either the program's learn mode or its point-and-click script editor.

DESIGN. Surprisingly, with all its unparalleled power, MicroPhone II is simple to use. Menus, dialog boxes and on-screen controls are well organized and pleasant to look at. Its "outstanding" manual is easy to read, clearly laid out and contains a thorough index.

SPEED. Routinely clocked at 18,000 bits per second over ordinary telephone lines, MicroPhone II is the fastest telecom software around. Its file transfer protocols — XMODEM, 1K XMODEM, YMODEM, YMODEM-G, Kermit and ZMODEM — are all optimized to make your files fly across the country or around the world. The intelligent ZMODEM negotiates the most treacherous channels of a packet-switched network and resumes broken transfers with no loss of data.

COLOR OPTIONS. MicroPhone II lets you assign color icons to your scripts, thus turning the *icon bar*, shown here, into your control panel. The icon bar can be scrolled,



resized and placed vertically or horizontally anywhere on the screen, awaiting your next click. Choose icons from the large collection provided with the software, or create your own.

CRUISE CONTROL. Flexible scripting means that MicroPhone II can run on *automatic* while you're taking care of other important business. Whether collecting your electronic mail in the background, or calling Paris at midnight to transmit the daily sales report in French, the program is always at your service, saving you time and money.

RELIABILITY. Because Software Ventures' engineers value your time on-line, they spend countless hours applying the most rigorous testing procedures to ensure that the program is crash-resistant. In the words of *The Macintosh Buyer's Guide*, MicroPhone II is "the most reliable of all the telecom programs we tested."

TEST DRIVE. Software Ventures so firmly believes in its superior technology that it gives you an unprecedented chance to *test drive MicroPhone II for 30 days risk free*. If for any reason you wish to return the program, you may do so for a full refund of your purchase price directly from Software Ventures — no questions asked.

But enough talk. Start using MicroPhone II today and find out for yourself why Jim Seymour and John Dvorak are the great communicators. After all, having invested all this money in the best hardware in the world, don't you deserve the best software?

Jim Seymour:

"... arguably the best communications software ever written."

John C. Dvorak:


"... stunning. Fast, slick; it does everything except slice bread."

See us at Booth 1500, Bayside Center, Boston, MacWorld Expo, Aug. 9-12

SOFTWARE
VENTURES


Rumor Manager

Gossip, Guesses, and Goings-On

 It's time to conclude the tour of the Apple engineering R&D labs that we started last month. (If you missed the first installment, you might want to go back and read it first.)


After we toured the laptop labs, the next area we came to was securely locked. The entry device at the main door kept asking for our password in MacinTalk tones. We tried several obvious passwords and then typed in "DrinkPepsi," after which the door unlocked itself. We were in the sprawling main CPU lab.

Machines of all sizes and configurations were scattered about. Methodically combing the room, we found a section dedicated to really large prototypes running what appeared to be a UNIX-like language. The main processors were mostly 68040s.

 We found an area that had partially disassembled IBM PS/2 Model 80s and a few stray Sun workstations. And, yes, there was a NeXT machine there too. It sprouted numerous test leads and was hooked up to all sorts of electronic instrumentation.

As we moved on, we came to machines that looked much like the current Plus and SE, sitting in stock Plus and SE cases. Delicately opening them revealed that they were 68030- and 68040-powered. Not surprisingly, we couldn't find a single 68000 or 68020 CPU anywhere in this lab.

There were so many prototypes that we didn't have time to look at them all. We tried to determine the clock rate of the CPU in each case, however. Most of these machines were running at 33 megahertz and higher. We found several 44-megahertz chips, two 50-megahertz units, and one 86-megahertz chip (which wasn't installed on any board). There was also an open vault that held some very fast RAM chips (25-, 45-, and a lot of 65-nano-second models). It looks like good caching won't be enough in the future.

 We left the CPU lab, locking the door — which said, "Have a good day" — behind us. We then moved on to the mass-storage lab.

As expected, we found lots of small hard drives. Some of these 3.5-inch units were marked to indicate data-storage capacities of 240 megabytes. Most of the hard-drive assemblies were made by Sony, confirming the recent change of drive-assembly suppliers. We were intrigued by the Sony 2-inch drives. The data sheets on these drives indicated that the baby hard disks held 36 megabytes each! They weighed a few ounces, and their electrical requirements were so low that it appears regular D cells will easily power them. We suspect you'll first see these tiny hard drives in one of the laptops.

Storage media aren't limited to hard disks. We saw optical read/write drives in 650-megabyte and 1.3-gigabyte sizes. These appear to be Sony-made units. Several were in slick plastic prototype shells, so they are nearly ready for release (or at least preview). Other media included several tape units. The DAT unit was particularly impressive and also looked ready to ship. It's about the size of a normal external hard disk and is very quiet. If Apple can hold its price down to a couple of thousand dollars (a faint hope, in our opinion), it should become a best-seller.

Heard any good rumors? If we use your rumor, we'll send you a token of our appreciation and promise not to use your name. Anonymous contributions are also accepted.


■ ■ ■ ■ ■

Our U.S. Mail address is Rumor Manager, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 74206,204 (on CompuServe), and MacUser.Edit (on AppleLink). No calls, please.

UTILITIES

XTreeMac

XTree is a big hit in the DOS market, but its first Mac incarnation stops far short of seriously challenging the Finder.

 It's hard to imagine what XTree had in mind when it designed XTreeMac. Some features of this disk-management system are unique, and a couple could be handy, but the execution of the program as a whole leaves much to be desired.

WHAT IT IS The chief task of Finder replacements and enhancements is to make the Mac even easier to use. XTreeMac has promise but doesn't deliver. Worse, the program is plagued by bugs that disqualify it from serious consideration.

The basic metaphor of XTreeMac is a good one: Each mounted disk appears on a file card, and you pick the disk you want to make active by clicking on a tab. All folders, documents, and applications appear in alphabetical order, and you can select how many levels will be shown when you start the program.

XTreeMac lets you launch applications and documents by simply double-clicking on them and adds a function to move files across disks to supplement the Finder's limited copying ability. A complete Get Info function gives you control over a file's type and creator as well as over programmers' status bits.

One fascinating feature of the package is Revive-A-File, an INIT and invisible-file combination that can restore as many as the last 100 deleted files on your system. When you drag a file to the trash, space opens up on your disk, but you can recover the file by dragging it out of a special Deleted Files folder. (If you save anything to disk, however, you might overwrite a deleted file before you can recover it.)

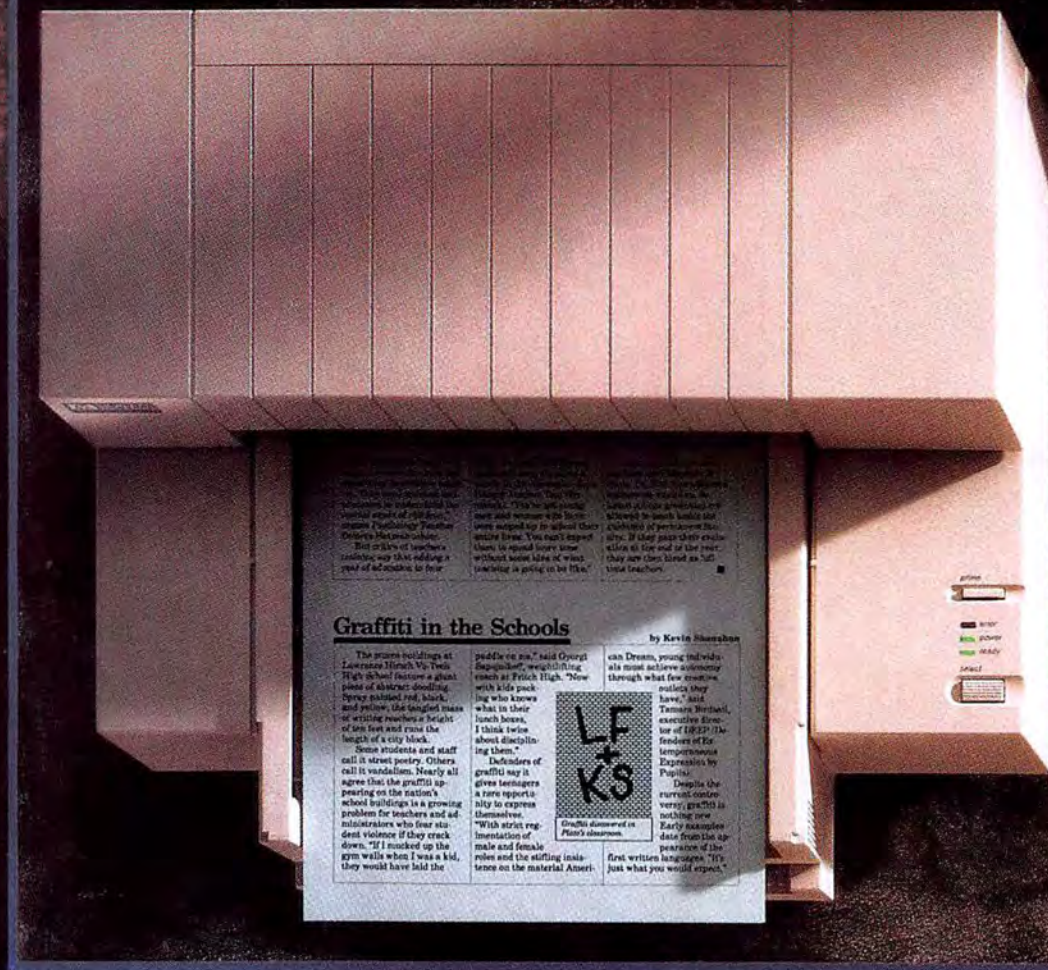
Documents, folders, and applications

You've been practicing
for years.



Now it's time to play.

*Suggested U.S. list price. ©1989 Hewlett-Packard PE 12921



Introducing the HP DeskWriter printer
for the Macintosh. \$1195.*




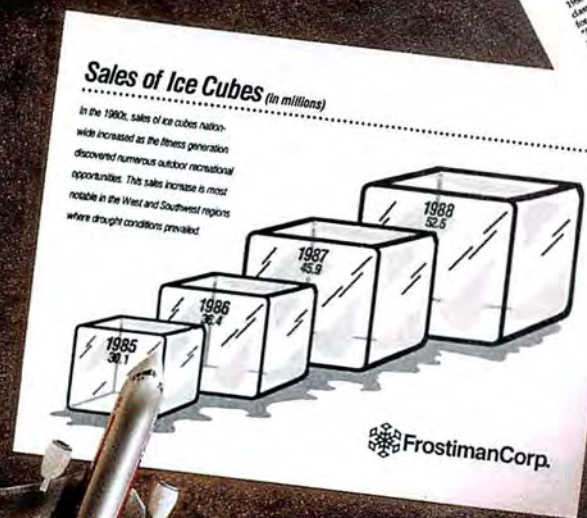

RESUME: Linda Fitzsimmons
17 Old Mill Lane
New Lucan, CT 06079
(203) 555-1228

OBJECTIVE:
To work as an interior decorator.

EXPERIENCE:
Principal Secretary, Manning Industries, 1986-present. Taught employee etiquette class. Adapted Southwest office scheme for executive offices. Coordinated "How to Tie a Tie" for Dornier from the Mayberry Pilgrimage.
President, Creative Color Designs, 1985-87. Developed auxiliary average students for internships and small venues.

EDUCATION:
B.A. degree in Mass Communications, University of the Adirondacks, 1984.
Spent the fall semester of junior year at L'Ecole de Beaux Arts, Lucerne, Switzerland.

REFERENCES:
Available upon request.



Mr. and Mrs. John Fitzsimmons request the
honour of your presence at the marriage of
their daughter
Linda Helene
to
Mr. Kevin Stimulation
at four o'clock on the twenty-third day of
November, nineteen hundred ninety, at the
Church of Our Saviour, Mayfield.
Reception to follow.
The favour of a reply is requested.

The new HP DeskWriter printer for the Macintosh puts laser quality on your desktop. With its advanced inkjet technology you can print text and graphics, even scalable outline fonts, at 300 DPI. Just like a laser printer. But unlike a laser printer, the

DeskWriter is priced so you can have your own. No more waiting in line for output. Or having your work scrutinized by the office busybodies. And at a compact 15"x17"x8", the DeskWriter fits neatly next to your Macintosh. So call 1-800-752-0900,

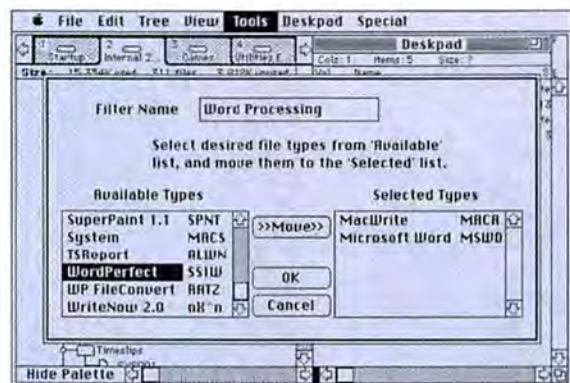
Ext. 688E for your nearest authorized HP dealer and a demonstration. And keep the laser quality all to yourself. There is a better way.



Please circle 21 on reader service card.



XTreeMac starts where the Finder left off, with features such as Revive-A-File (indicated by the folder with the Red Cross-type icon), which can undelete up to 100 trashed files.



XTreeMac lets you build filters that screen out everything except a user-specified set of document and application types. Unfortunately, XTreeMac's innovative feature list is stronger than its implementation.

from many disks can be gathered on a "deskpad" for group copying, moving, or deleting. It's a minor convenience for working with lots of files.

XTreeMac lets you create "filters," which you can use to display only certain applications or documents. It's possible, for instance, to build a filter that displays only paint or draw files, or only files created by FreeHand. You can also put applications onto a pull-down menu so you won't have to root through file trees to find a favorite program.

HOW IT WORKS The program has some serious difficulties. XTreeMac scans every mounted drive — whether it is local or on a network — and tries to keep up-to-date with every change on every drive. Pulling that volume of information across a network can bring the network to its knees. To its credit, the manual says that

the program shouldn't be used on a network, but you don't find that out until after you've bought the program.

— Daniel J. Rosenbaum

Get Info

XTreeMac 1.0

List Price: \$99

Published by: XTree Co., 4330 Santa Fe Road, San Luis Obispo, CA 93401; (805) 541-0604.

Version: 2.0

Requires: System 4.2 or later; Finder 5.3 or later.

Compatibility: Mac 512KE or later; not compatible with TOPS or AppleShare.

Application Size: 257K

Copy Protection: None

UTILITIES

MultiClip

If one Clipboard isn't enough, MultiClip is the utility you've been waiting for.

□□ The Mac wasn't the first computer with a Clipboard, but it did make cutting and pasting far more accessible to far more people. But as good as it is, the Mac's Clipboard hasn't kept up with the rest of the System. Its most significant limitation is that it holds only one item at a time. The next time you cut or copy, whatever was already on the Clipboard is irretrievably lost. And, in general, you can't append anything to what's on the Clipboard. (Appending to the Clipboard is supported by Apple system software, but very few applications have chosen to implement it.)

WHAT IT IS MultiClip, a Startup document (also called an INIT), adds several new dimensions to the Clipboard. It allows as many Clipboards (which it calls ClipFrames) as you have disk space for, lets you rearrange the order of the ClipFrames, allows limited editing of material in the ClipFrames, and can import from and export to Scrapbooks and some other documents.

This neat program can be used as a replacement for both the Clipboard and the Scrapbook, and it offers new power for users who do a lot of cutting and pasting. The cost is some additional complexity. MultiClip is a relatively large program, and it has lots of commands and options. You'll need to take the time to master many — if not all — of them to get the most out of MultiClip.

HOW IT WORKS Installation is simple, as it is for all Startup documents. Copy or drag the MultiClip file into your System Folder and restart, and you're ready to start using MultiClip. You'll need to consult at least the reference card to get going. You invoke MultiClip's basic Copy, Cut, and Paste operations by add-

EVERYBODY NEEDS A LITTLE EXPERT HELP RETRIEVING FILES.

Introducing Retrospect.™

The automated way to find what you file.

After more than a few dozen folders, life gets complex. It's no longer easy to find what you want. Especially as your hard disk runs out of space.

That's when you need a librarian—Retrospect. The first storage management tool for the Macintosh.®

Retrospect works just like a librarian, handling all the work of storing, retrieving, and backing up files.

Add as much storage as you need. Retrospect manages everything for you. It's compatible with tape, disk cartridge drives, AppleShare® and TOPS® file servers, and more.

Using Retrospect's mouse-driven "browser," you can scan the entire contents of your hard disk. To archive, click the files and folders you want, one-by-one or in groups. Another click and Retrospect is off archiving for you.

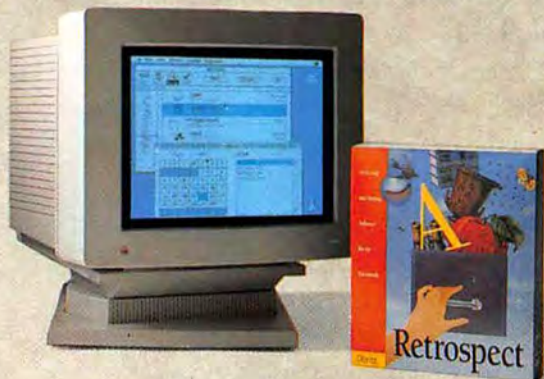
Retrospect can also be programmed to automatically archive and backup whenever you want. During off hours, when you're not around. So every Monday at midnight, for instance, you can have files older than a month archived.

Retrieving is just as easy. Retrospect's file list, or "card catalog," makes all your folders and their contents visible at a glance, without inserting the media. Just click the files you want. And Retrospect gets them for you. Even telling you what cartridge or other media to insert.

The bottom line: Retrospect lets you infinitely increase your storage capacity. Easily backup everything. And get your hands on any file, fast.

For details and a demo, see your nearest Macintosh dealer. Or write or call Dantz Development Corp., 1510 Walnut Street, Berkeley, CA 94709, (415) 849-0293, FAX: (415) 849-1708.

Because in storage and retrieval, Retrospect is the automatic choice.



Dantz

Dantz Development Corp.

Retrospect is a trademark of Dantz Development Corporation. Macintosh and AppleShare are registered trademarks of Apple Computer, Inc. TOPS is a registered trademark of Sun Microsystems, Inc.©1989 Dantz Development Corporation

Please circle 33 on reader service card.

Peel this Apple and get Macintosh performance without the Macintosh price.

On the surface, this Apple[®] appears to be a flawless, shiny Lisa.[™] But get under its skin and you'll discover Macintosh[™] Plus capabilities in all their glory. There's just one way this Apple doesn't measure up to a Macintosh. At \$695*, the Lisa falls impressively short of a Macintosh Price tag.

Meet the New Lisa with MacWorks[™] Plus

We thought it looked like a



perfect match: the highly efficient Lisa and the myriad of Macintosh software solutions. On the one hand, there was the Lisa, a professional business computer with an extra-large 12" screen, Macintosh graphic interface, familiar mouse, easy-to-reach internal components, space for an internal hard disk drive, and three expansion slots. Then there was the popular Macintosh Plus, with its amazing capabilities, functionality and software applications.

To bring the two together, we developed a software program called MacWorks Plus. MacWorks Plus brings Macintosh functionality to the Lisa, plus compatibility with every application that runs on the Macintosh Plus. With MacWorks Plus, the Lisa can run HyperCard, MultiFinder, WordPerfect, Adobe Illustrator and Cricket Draw. (To name a few.)



The Apple Lisa with MacWorks Plus runs the latest Macintosh software.



How we Support Lisa and MacWorks Plus

We do a lot more than market the Lisa and MacWorks Plus. We offer a complete line of out-of-production, new and used Apple-compatible products. And we're the only company authorized by Apple Computer Inc. to sell and service their out-of-production equipment. Because of this, we have invested sizeable resources in developing improvements for all of the out-of-production and reconditioned products we sell. Plus, every product that comes from us must pass rigorous Apple quality control tests. We also back our products with a 30-to-90-day, money-back guarantee.

Call 1-800-821-3221, extension 369 to order your Apple Lisa

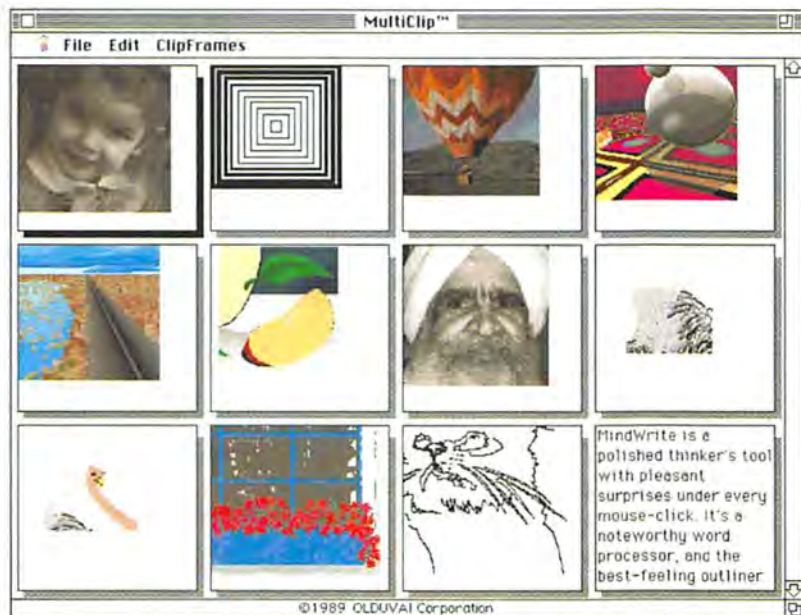
If you like the capabilities and compatibility of Macintosh, but don't like the price, pick the Lisa with MacWorks Plus. To order a Lisa, or get a copy of our product catalog, call 1-800-821-3221, ext. 369 and we'll send your order out today. All major credit cards accepted.



© 1989 Sun Remarketing, Inc. P.O. Box 4059 Logan, Utah 84321, FAX (801) 563-3226 * Depending on options.

See the Lisa perform like a Macintosh at Macworld Expo, Booth #5061, in the World Trade Center.

Please circle 37 on reader service card.



MultiClip multiplies the power of the Clipboard with multiple "ClipFrames." It usually operates in the background, but the MultiClip DA is always available, letting you see, use, and modify all your ClipFrames.

ing the Option key to the usual keyboard combinations (Command-C, -X, and -V). To see and manipulate the ClipFrames, either type Option-Command-M or select MultiClip from the Apple menu.

ClipFrames can be rearranged (by dragging), removed, or copied. You can do some editing of text, MacPaint, and PICT documents in the ClipFrames. ClipFrames that contain documents with mixed-format material (such as PageMaker documents) can be edited in either Text or Graphics mode, but you'll lose the other material (for example, editing a mixed document in Text mode loses the graphics).

What you get to see is up to you. You can change the number of ClipFrames shown in both the vertical and horizontal dimensions (without scrolling); the range is 1 to 6 each way, so you can elect to show 1 to 36 ClipFrames at a time. Showing fewer ClipFrames improves the speed. The size of text in ClipFrames and the amount of reduction (if any) of graphics

Trade Show BIZ

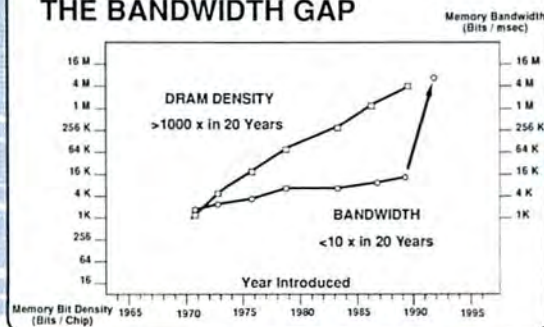
Advanced Systems Outlook

BURLINGAME, CA — Workstations are the thrust of many of Apple's plans for the Mac. What competition will these new workstation Macs face? The Advanced Systems Outlook seminar focused on two main application areas: 3-D graphics and scientific computing. In 3-D applications, the Mac needs a big hardware boost to compete with the mostly UNIX-based platforms built for dedicated graphics use (such as those from Pixar and Silicon Graphics). As Donald Gaubatz (group manager for workstations at Apple's Digital Equipment) put it, you can't simply slap a third dimension onto hardware built for 2-D. That, he said, is like trying to make a car out of a motorcycle by adding two more wheels.

But in some scientific applications, the Mac's interface gives it an edge, as revealed by a demonstration by Stephen Wolfram of his company's forthcoming new version (1.2) of Mathematica software.

John Moussouris, a founder of MIPS and now CEO of MicroUnity Systems, cited the closing of the bandwidth gap as the main factor driving the development of the next generation of workstations. In the past 20 years of computer-architecture development, dynamic-random-access-mem-

THE BANDWIDTH GAP



Courtesy of MicroUnity Systems

ory (DRAM) capacity has surged forward with a thousand-fold increase in density, while microprocessor bandwidth has shown only a tenfold increase, creating a bottleneck in microcomputer performance.

But as RISC (reduced instruction set computer) technology penetrates the workstation market, this gap will close, and RISC-based workstations — with CPUs that integrate processing and memory caching — will have, in the early 1990s, computing capacities exceeding 100 million instructions per second (MIPS), which outstrips mainframe performance. This power, says Moussouris, will transform workstations from the fancy calculators of yesterday and the thinking machines of today into the intelligent workhorses of tomorrow.

Shifts & Options

Industry Notes and Trends

IBM has announced another software family to accompany its newest version of the Extended Edition OS/2 operating system (so far, you can still count all of IBM's operating systems on one hand — just barely), and — surprise, surprise — it looks like Macintosh software. Yep, that means icons, menu bars, mouse-driven object-oriented graphics — they're all there.

And Big Blue claims that its OfficeVision products will have the same interface across all IBM platforms — from PCs to mainframes. Sounds familiar, doesn't it? Maybe if IBM had snuck into Xerox PARC back in '79 . . .

And to give Macintosh users a taste of the same medicine,

Apple will now have two Macintosh operating systems. Adding to the confusion, with System 7.0 — whenever that is — an application won't have to be a desk accessory to be available as a desk accessory, a LaserWriter driver won't have to be called a LaserWriter driver to drive a printer, and fonts won't have to be installed with the Font/DA Mover.



IF YOU CAN DREAM IT, YOU CAN DRAW IT.

First, you start with ideas. And they change as you continue to refine them. You need tools that work with you. To help you realize your visions and bring them to life.

It all began with MacDraft®. Now we bring you Dreams®.

With Dreams, we give you all the precision tools you'd expect like scales, zoom, rotation, area calculation, associative dimensioning and layers. But we don't stop there. Merge objects together or subtract them from each other. Use Bezier or spline curve tools to create smooth shapes. Select from an array of line editing tools and custom color patterns for infinite varieties of personal expression. Store commonly-used images in on-line libraries and easily output your drawings to Postscript® devices.

Dreams. From precision drawing and drafting to general-purpose graphics.

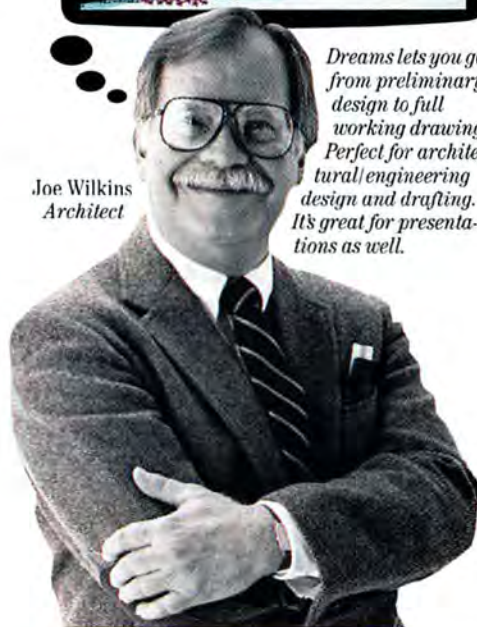
Of course, the best way to experience Dreams is to try it yourself.

Just see your local Macintosh® dealer. Or call us at (415) 680-6818, and we'll send you a demo disk for \$9.95. Then you'll see how easy it is to get started on your dreams.



Joe Wilkins
Architect

Dreams lets you go from preliminary design to full working drawings. Perfect for architectural/engineering design and drafting. It's great for presentations as well.



Innovative Data Design, Inc., 2280 Bates Avenue, Suite A, Concord, CA 94520
Telephone: (415) 680-6818, Fax: (415) 680-1165.

Copyright © 1989 Innovative Data Design, Inc. All rights reserved. Innovative Data Design.

REVIEWS

are both user-controlled.

A particularly nice feature is the ability to import Scrapbook files into MultiClip files. You can import whole Scrapbooks or, using the View button, import only selected items.

MultiClip comes with a good and complete manual (notwithstanding the lack of an index). A reference card clearly indicates all the commands and includes space for two custom sets of keyboard commands. The manual has a good troubleshooting section, and Olduvai offers capable telephone support. The manual doesn't mention a toll-free number, but there is one: (800) 822-0772.

I've customized my copy of MultiClip extensively. I have it set to Always On (in the Preferences on MultiClip's private File menu), which means that all normal Cuts, Copies, and Pastes go through MultiClip (so I don't need to remember to press the Option key), and I've set the Paste mode to Reverse, so that the last item entered is the first Pasted. That makes

MultiClip act like the regular Clipboard most of the time but gives me its extra power whenever I need it.

There isn't much I'd want changed or improved. Opening can be slow if you have lots of ClipFrames in the active file. And the occasional incompatibilities — which never caused crashes or data loss during my testing — are generally the fault of programs that don't follow Apple's explicit programming guidelines. I would like MultiClip to be customized to take account of these known problems (private Clipboards in Word 3 and Illustrator, for example), but the program is already big, and I'd hate to see anything added that might reduce its excellent stability. The DA window can be enlarged, but, unfortunately, it doesn't remember its size and has to be enlarged each time it's opened. The dialog boxes and subwindows all appear on the main screen (if you use multiple monitors), regardless of where the DA window is placed. That can be awkward. None of

these problems is serious.

Some users have reported conflicts with some programs. Although I've tried to recreate the problems, I've never been able to. I use MultiClip all the time.

— Steven Bobker

Get Info

MultiClip 1/2

List Price: \$69.95

Published by: Olduvai Corp.,
7520 Red Road, Suite A,
South Miami, FL 33143;
(305) 665-4665.

Version: 1.0

Requires: System 6.0.2 or later.

Compatibility: Mac Plus or later.
Can be disabled with programs
such as Word 3 and Illustrator
that use a private Clipboard.

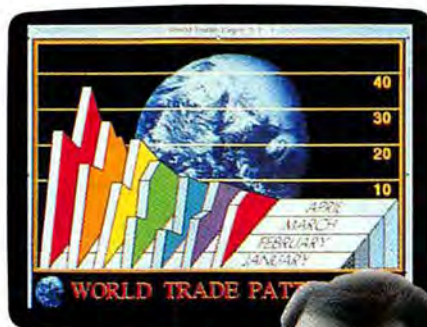
Application Size: 137K

Copy Protection: None



Text and line art tools
are easily accessed in the
most fluid, free-flowing
interface available
anywhere. Perfect for
technical illustration in
desktop publishing.

Charles Wyke-Smith
Printz Electronic
Design Services



With Dreams' strength
in color, your business
graphics and general designs
never looked better.

James A. Collins
Illustrator

DREAMS MODULES

IDD SYMBOL LIBRARIES

To make drawing easier,
we've developed



a series of
Architectural Symbol

Libraries. There's Residential
Construction, Light Com-
mercial Construction and
Preliminary Design. Each
sold separately with more
on the way.

IDD PLOTTER DRIVER

With our optional
plotter driver, you
can plot directly
from Dreams for better
resolution and faster out-
put. From A to E size. It
works with most of the popu-
lar plotters including Hewlett
Packard, Houston Instru-
ments and Calcomp.



Laser Quality Under \$1000*!

The Hewlett-Packard® DeskJet with the Grappler® LS interface offers 300 DPI at 1/3 the price.

You purchased a Macintosh for its ability to produce quality output. Problem is, you can't afford a laser printer. At \$2000 and up, your only real alternatives have been dot matrix printers or regular trips to the local copy store.

Why settle for dot matrix output when you really need laser quality? The Grappler LS easily connects the DeskJet to your Macintosh, providing...

- 300 DPI resolution
- 14 pound portability
- Small footprint, smaller than an ImageWriter™ II
- Inkjet refills for less than \$20
- Compatibility with H.P. LaserJet, DeskJet, and LaserJet compatibles

Only the Grappler LS provides full 300 DPI graphics (*laser quality*), and allows you to print both portraits and landscapes. With the standard Apple printer driver provided in the Grappler, you get complete WYSIWYG text and graphics because your printer acts the way your Macintosh expects it to. The Grappler LS is fully compatible with hundreds of popular software titles including Excel®, MS Word®, MacDraw II®, Power Point®, Super Paint™, and PageMaker®. And because the Grappler LS comes complete with cable, Apple driver, Installer, fonts and a powerful spooler, there is no need for additional purchases.

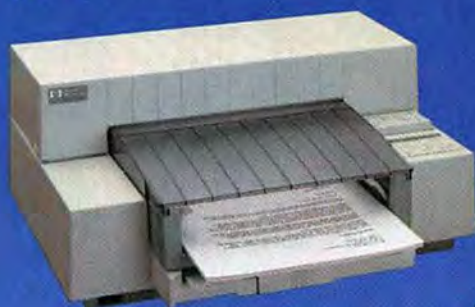
GRAPPLER LS list price: \$149

 **Orange Micro
Inc.**

1400 N. Lakeview Ave., Anaheim, CA 92807
(800) 223-8029, In CA (714) 779-2772

Grappler; Apple, Macintosh and ImageWriter; Hewlett Packard, LaserJet; and DeskJet; Excel; Panasonic; are trademarks or registered trademarks of Orange Micro, Inc., Apple Computer, Inc., the Hewlett Packard Co., the Microsoft Corp., Silicon Beach Software, Aldus and Panasonic Industrial Company, respectively. Other trademarks or registered trademarks are the property of their respective owners.

*Average total selling price. Printer suggested retail \$995.00



Until now, Macintosh dot matrix printing has meant only two things: 9 pin, narrow carriage output for about \$600, or high quality, wide carriage output for about \$1400. The Grappler LQ opens up a world of dot matrix printers for the Mac, at a fraction of the cost. These include popular Epson, Okidata, NEC, Toshiba and Star Micronics models, as well as all compatibles.

Now the choice is yours!

For example, consider the Panasonic 1124 printer. With output at 180 DPI and the ability to run continuous feed or multiple part forms, this sturdy printer will get the job done with crisp and clear efficiency.

The Grappler LQ uses a standard Apple printer driver so your printer will act the way your Macintosh expects it to, providing compatibility with hundreds of popular software titles (see Grappler LS above). The Grappler LQ gives you full 180 DPI output and allows you to print both portraits and landscapes (sideways on the page). And the Grappler LQ comes complete with cable, 3 fonts, Apple driver, Installer and a powerful spooler. All you supply is the Macintosh and the printer.

GRAPPLER LQ list price: \$149



**Average total selling price. Printer suggested retail \$529.95

The Panasonic® 1124 with the Grappler® LQ means
**Mac 24 Pin Printing
Under \$500!****

EDUCATION

Voyager

This desktop planetarium is perfect for everyone with stars in their eyes.

When I was a child, one of my prized possessions was a star finder, bought on an excursion to New York's Hayden Planetarium. At first glance, Voyager might seem like a computerized descendant of those simple cardboard disks, but it's really more closely related to the planetarium I visited than to the star finder I took home.

WHAT IT IS The core of Voyager is a 14,000-object database, which includes 9,100 stars (including 1,600 binary and 160 variable stars); 3,000 deep-space objects (galaxies, clusters, and nebulas); 88 constellation outlines; the nine known planets of our Solar System; and the major moons of Jupiter.

The sky can be displayed as a star chart, a celestial sphere, or a view from any place on earth. Viewing locations may be entered as longitude and latitude or from any of 135 major cities. You aren't earthbound, though. Voyager also lets you view the universe from any planet or from any fixed location within a range

of 100 astronomical units (1 astronomical unit = 93 million miles, the mean distance from Earth to the Sun) — yes, even outside the Solar System. And Voyager is just as flexible with time. It can show you the firmament at any date from 1000 B.C. to A.D. 4000.

Click on any object, and Voyager pops open a data box. For example, star data includes name, Yale number, type, distance, magnitude, location coordinates, and more. The program also incorporates a search routine that locates objects by name, number, or descriptive adjective.

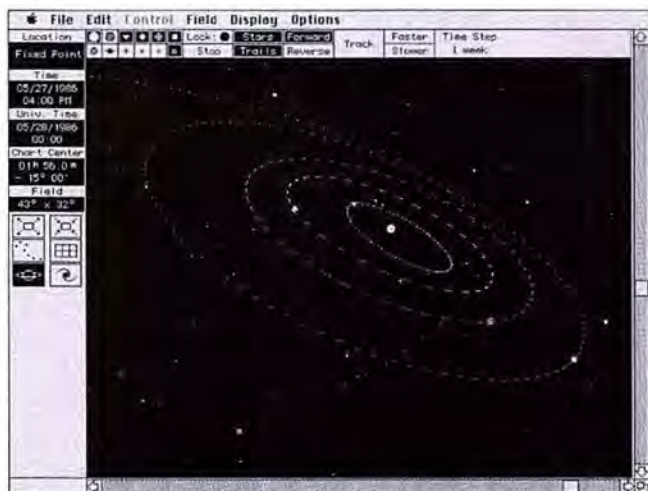
Voyager is chock-full of features — too many to detail here. It displays the outlines and names of constellations, such as the Southern Cross. It denotes Messier objects as well as binary and variable stars. It allows adjustment of magnitude (brightness) limits to control the number of objects displayed. It rotates the sky at a variety of rates. It can track the planets, showing their orbital paths with dot trails. It can display an orrery view (from above) of the Solar System. And it even permits you to define the orbit of a new object, such as a newly discovered comet.

Voyager comes with a selection of interesting astronomical phenomena (eclipses, planetary occultations, and some famous comets) ready to be loaded. It can save your settings for later use and output sky charts (use the White Sky option) on standard printers. Printed charts are automatically stamped with identification data.

HOW IT WORKS Voyager is fast. It doesn't keep you waiting for information, and it moves you across the galaxy in warp drive. It's also stable. In Finder or MultiFinder, the program is as dependable as Halley's comet. Improvement? How about the ability to make your view-

ing location the startup default. Currently, you must save your settings and launch with that file. Picky? Well, there isn't much to complain about.

Voyager is billed as "the interactive desktop planetarium," but that's only half of its potential. At the trade show where I first saw it, Voyager was interfaced to a good-sized motorized reflector telescope. When an object on the screen was clicked on, the telescope moved to the coordinates of the target. With the proper hardware interface (check with Carina Software), the Voyager database can serve as the foundation of an automated observatory — astronomy departments, take note.



Voyager puts a planetarium at your fingertips. This is the path of Halley's comet through the inner Solar System during its recent visit. The square symbol at the lower left is the comet. Voyager details the various orbits with dot tracks.

If you have any interest in astronomy or simply wish to have the universe in your Mac, buy this program. Voyager will never replace the experience of shivering in the darkness beneath a canopy of stars, nor will it match the theatricality of a real planetarium — but it delivers an unprecedented amount of astronomical information at an incredibly low price, and that's no small feat.

Voyager is so good that it may even pry some users away from their Macs and into the nearest planetarium. Voyager will not only assist the current generation of astronomers but may also inspire the next.

— Carlos Martinez

Get Info

Voyager ★★★★★

List Price: \$99.50

Published by: Carina Software, 830 Williams St., San Leandro, CA 94577; (415) 352-7328.

Version: 1.0

Requires: Two 800K drives or hard disk.

Compatibility: All Macs with 1 megabyte.

Application Size: 619K

Copy Protection: None

A powerful argument for the Macintosh IICx.



One of the best arguments for owning the new generation of Macintosh® personal computers is the new generation of Macintosh software.

Presenting FullWrite Professional™ and Full Impact™ from Ashton-Tate®.

FullWrite Professional combines a full featured set of powerful writing and publishing tools with an interface that's so easy-to-use, it could only have been written for the Macintosh.

Full Impact brings the promise of Macintosh

to reality for the users of spreadsheets. Full Impact's accessible power lets you quickly place charts, graphs, text and numbers all on one page. All at one time.

Together, FullWrite Professional and Full Impact let you take full advantage of the full power of the Macintosh IICx. For a free sampler of either FullWrite or Full Impact, call 1-800-437-4329, ext. 2102.*

And who could argue with that?

 **ASHTON-TATE®**
MACINTOSH DIVISION



A powerful argument for FullWrite and Full Impact.

The Macintosh IICX is our newest member of the Macintosh family. It's sleek. It's powerful. And it's exceptionally versatile. But and best of all, it's a Macintosh. Which means you already know how to use it.

But to truly appreciate the Macintosh IICX you have to see it at work. Blazing through spreadsheets. Or creating professional quality documents that look like they came from a publishing house.

And the best way to do just that is to call

1-800-538-9696 for the name of an authorized Apple® reseller who can give you a demonstration of the Macintosh IICX with Ashton-Tate's FullWrite Professional and Full Impact software.

We're sure that one demonstration will resolve any arguments you may have been having about which computer you should have.



The power to be your best.™



Presentations with Punch!

**Banish Boardroom Boredom
with Animation!**
Where still pictures take the
place of many words, animated
pictures speak volumes.

A city-planning director stands at the front of a boardroom explaining how the city will expand its residential and commercial zones. The audience sits, ready to hibernate. On the screen, a digitized photo of a building site fades in. As the planning director speaks, roads extend themselves and buildings sprout in a simulated downtown. The presentation's background music changes as statistics on city traffic appear on the screen in the form of a chart whose bars are composed of slowly accumulating cars. The audience watches intently for new changes as cars and buses move along the city streets, illustrating transportation bottlenecks. A subsequent scene shows new streets and freeways popping up around town. Inspired rather than expired by the presentation, the planners spend the next few hours hammering out the finer details of the city's plan.

Once considered only an art form, animation is now being used in business for presentations, training, and simulation. Adding animation to presentations can give clarity and punch to a visual explanation. It also works wonders to lengthen short attention spans. An ordinary presentation seems passé when compared with the message that animation packages can convey.

Me, Animate?

Consider whether the message of a presentation or demonstration can come across better with the aid of animation. If the subject is sleep-inducing, you should definitely try to get movement into the show. For complex subjects, animation supports explanations, reduces hand waving and verbal garble, and saves time for everyone concerned.

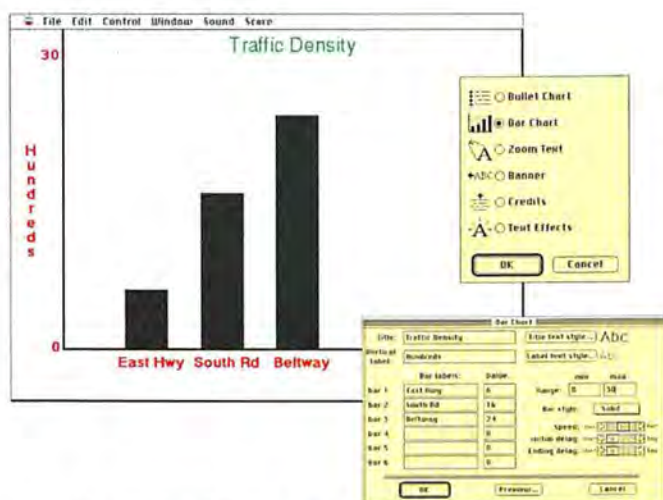
You don't have to be a highly trained professional to put together an animated presentation. With the programs we'll be examining, MacroMind Director and Studio/1, all you really need is some familiarity with paint, draw, and perhaps presentation programs. With a little practice, you can create a decent animated presentation.

Animations are not as simple as still graphics. You'll need to spend some time with samples, tutorials, and manuals. You'll find easy shortcuts for effects that could have taken hours to achieve by hacking and guesswork. Both MacroMind Director and Studio/1 come with sample animations and their components, such as cast members, graphic documents, and sound files. You can open them, examine their workings, and see what techniques were used. Experiment on your own, when not under production pressure, to see what you can create.

PHOTOGRAPHY: MEL LINDSTROM

**By Salvatore Parascandolo
and Kristi Coale**

Animation



Director: AutoAnimate a Graph

Using Director's AutoAnimate dialog box, you can select predefined animated-text effects or self-rendering charts, and then fine-tune their action. The bars of the chart automatically grow from the minimum value to the value you specify. You can set the speed, start delay, and how long they linger after finishing. The Preview option is handy for making sure you have the effect you want.



A Seasoned Director

MacroMind Director is currently the highest-horsepowered animation tool for the Mac. Although it can't single-handedly create everything you need, it can combine or animate just about anything you have. With its ability to synchronize a wide variety of graphic elements, text, sounds, transitions, and visual effects, Director is the lone choice for creating Macintosh-based high-end animated presentations.

Director's still-thriving predecessor, VideoWorks II, was a breakthrough product in both its ambitious scope and its interface. Director is far more capable than VideoWorks II, yet it's even easier to use. To really rev up its dormant animation engine, however, you must read its excellent user manual to understand its symbols, options, and window-related modes.

Director can create text and graphics, as well as import art in MacPaint, PICT, and PICT2 formats from such programs as Studio/8, PixelPaint, Canvas, SuperPaint, MacPaint, and Glue. It can also import color palettes and sounds from various sources and animations saved as

Interactive Animation

After you've given movement and sound to your presentation, you can go one step further. The best demos and training programs are interactive, drawing users into the action and letting them navigate freely by choosing areas of concentration and skipping over unnecessary parts. Neither Director nor Studio/1 offers much interactivity beyond starting and stopping. HyperCard, with its links, ease of use, and wide availability, is ideal for creating and using interactive training programs, but it offers no power animation tools. SuperCard builds on HyperCard's features with color, movable objects, multiple resizable windows, and other enhancements, including script-driven animation, but it lacks the rough-and-ready animation horsepower built into Director and Studio/1. Fortunately, with a little help from some friends, you can combine the two Cards' interactive abilities with the visual

powers of sophisticated animation.

Studio/1 comes with a (nearly) self-installing XCMD that, once added to any stack, lets it play native (S1AN) animations. VideoWorks II has a HyperCard driver that similarly accesses VideoWorks movies but with greater versatility. HyperAnimator and SuperAnimator create "talking actors" to bring lip-synched life to HyperCard and SuperCard presentations.

The HyperCard Connection

You install Studio/1's XCMD by opening the Studio/1 Demo/Instruction stack, clicking once to go to the Installing card, and clicking again to copy the XCMD to any stack. Once the XCMD is installed, you create buttons to access the animation. In addition to the XCMD, Studio/1's stack includes sample scripts that offer several ways to play animations. They can be played in a specific rectangle anywhere on the card, fill the card, or fill the screen. Two animations can even be played simultane-

ously. There are options to control the animation mode and speed and to turn associated sounds on or off. The XCMD can be freely distributed.

VideoWorks II's animations can be played in HyperCard in a manner similar to Studio/1's, but the VideoWorks II HyperCard Driver must be bought separately. You install an XCMD into your stack, but it's not a stand-alone operator. The driver, which must be kept in the same folder as the subject stack, offers numerous options, such as playing specific frames and preloading a movie. In addition, up to 16 movies can be designated to play sequentially. Color movies play in full color on a Mac II. You can elect to play a movie at a specific card or screen location, with the background saved, and have it repeat until there is a mouse click. With features such as these, VideoWorks II gives far more control over the animation in stacks than does Studio/1. Scripts for these options are included in the driver's manual, which is also a HyperCard stack.

More options, including movies with different color palettes and resident sound resources, will be available in the MacroMind HyperCard Driver (release planned for July), an upgrade that will take advantage of the special features in MacroMind Director. It will sell for about the same price as the VideoWorks II HyperCard Driver (\$99.95), with a special upgrade price.



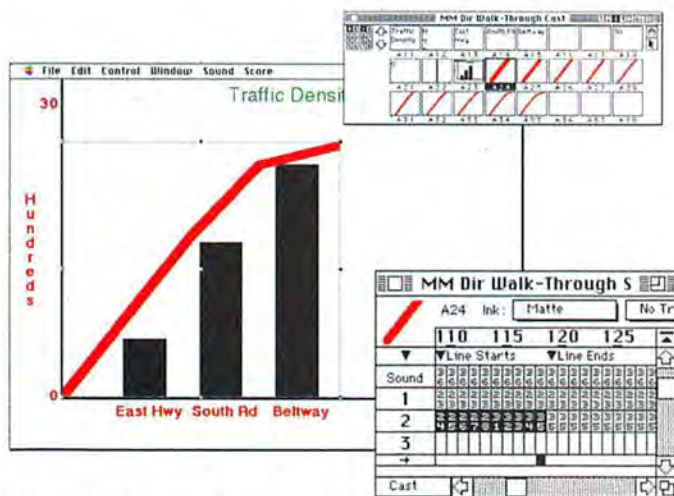
Scrapbook pages or in PICS or VideoWorks format.

The Director's Overview

Director has two easily switchable modes: Overview and Studio. The Overview mode is like a post-production facility in which all the elements of a show are assembled, tweaked, synchronized, and blended. This mode is the key to creating quick and slick presentations from existing art and built-in effects.

The AutoAnimate facility is a power tool that lets you create and control the timing and duration of animated effects with charts and text. It also serves as one of three direct links to the Studio portion of Director, allowing you to create custom film clips for presentations.

The Overview environment is much more than a slide sorter. It lets you easily sequence complex sets of events such as color fading in, music starting, and an animation sequence kicking off the presentation. If you were simply to lay in a sequence of scenes, your presentation would look a little rough and low-budget. Director includes strong editing capabilities for polishing a presentation.



Director: Add a Red Line

A copy of the completed graph image was used as a background guide for drawing the red line. The effect of growth over ten steps was achieved by making ten duplicates of a whole line and trimming parts from each copy. Here Director's Cast window shows each segment, as a castmember scaled to fit its rectangle. The highlighted score segment animates the growing line.

SuperCard Animations

SuperCard (see "A Wilder Card," March '89) offers real windows and resizable, restackable, reshaping objects that you can animate with SuperCard's Move command. SuperCard's math, logic, and mouse-sensing functions let you calculate an object's intended path and speed on the fly, to suit the event, which means exceptional flexibility and power for interactive productions.

To create an animation entirely with SuperCard, you need objects and a script. The script identifies the object to be moved and the points it must visit. You can move the object from one point to another, along the perimeter of a polygon, or along a freehand curve. You don't even need a path object — any set of comma-separated x,y-coordinates will do. To simulate a car on a road, you create or import the car graphic, name it Car, and then draw a freehand or polygonal roadway and call it Road. Finally, write a short script containing the statement Move graphic Car to the points of graphic Road. That's it. You can optionally specify the speed of the motion and record the frames of action as a PICS file, which is exportable or playable by SuperCard.

Animated Agents

Beyond interaction, there's another way to enliven your stacks — HyperAnimator (see NewsLinks, May '89), from Bright Star, con-

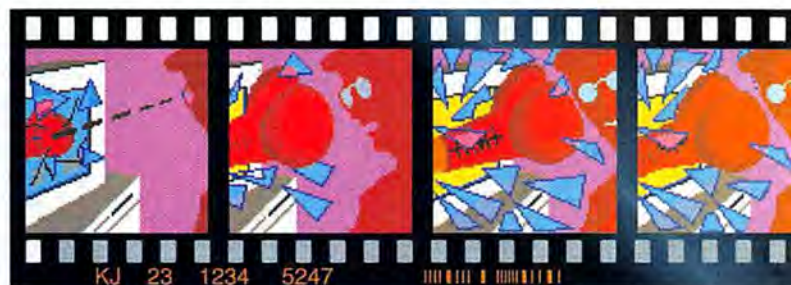
tains an XCMD, RAVE, that lets you place talking characters into your stacks. Each actor has 16 images with eight facial expressions and seven lip positions. When the actors talk, their lips move to the correct positions and their expressions change. You create or import an

actor in HyperAnimator's dressing room; save it to a stack; and create buttons to access and play it, a field into which to type what the actor will say, and a Talk button to cue the actor to speak.

Close on the heels of SuperCard comes a hyped-up HyperAnimator called SuperAnimator (release of which is planned for September). SuperAnimator is a stand-alone application written in SuperCard that provides color and gray-scale resizable actors. You can have a grand total of 127 images in an actor's file, with 32 speaking images. Bright Star promises better synchronization of lip movements with digitized sound and the ability to call up talking actors from as many authoring environments as are in common use on the Mac.

Claris and other software giants have included demos and help stacks with products

such as MacWrite II, but the same processes are available and affordable for small-business and even home users. Occasional users may stick with HyperCard. For relatively little money, more sophisticated animations can be added with Studio/1 or animation and color with Video-



Works II. Or you may find that SuperCard alone — with its color, animation, and programmable capabilities — is the ideal, inexpensive way to go.

SuperCard is priced at \$199. Silicon Beach Software is located at 9770 Carrol Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

HyperAnimator costs \$199.95. For information about it and SuperAnimator, contact Bright Star Technology at 14450 N.E. 29th Place, #220, Bellevue, WA 98007; (206) 885-5446.

— Laura Johnson



Whether your business is big or small, find out why Double Helix is the most flexible tool ever made to help you manage your information.

Call 1-800-323-5423 today, and we'll send you the facts with no cost or obligation.

Please circle 137 on reader service card.



The software that let the man escape the animals.

Dr. David Brown of the All Creatures Veterinary Hospital in DeWitt, Iowa, knows what he wants. And he relies on Double Helix software to help him get it.

"I hate spending all my time on paperwork," he explains. "Now that we've got Double Helix, I'm not trapped in my back office anymore. So I can spend more time with my patients... *and* with my kids."

Dr. Brown's dogs, cats and horses create data-storage requirements every bit as demanding as those for human patients.

"With all the records we keep on the patients, their histories and their owners, we needed a really flexible program to manage our database. See, it used to take me all day to sit down and handwrite statements for accounts receivable. I hated it. And it kept me from seeing more patients, or from spending more time with each one."

Now, whenever Dr. Brown enters new information, Double Helix updates his patient files, mailing list and financial records simultaneously.

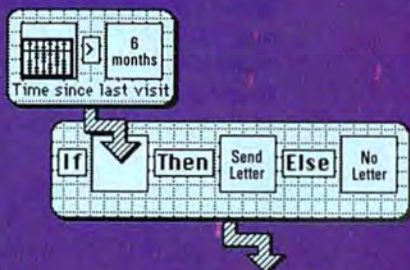
"I'm freed up now from billing, daily accounting and filing. A year ago, I didn't even have a computer. But I had a good idea of the format I wanted, and Double Helix *adapted* to it.

"It's incredible what Double Helix and the Macintosh® can do, and how simple it is to do it. If I ever go into joint practice, they've even got a 'multi-user' version where several users can get into it at once. I'm really just scratching the surface of what it can do."

Now that Dr. Brown has found a new source of leisure time, he knows exactly what to do with it.

"We'll never be rich, but we've got three great kids—10, 7 and 4. That's what it's all about, for me anyway. You know, small-town America."

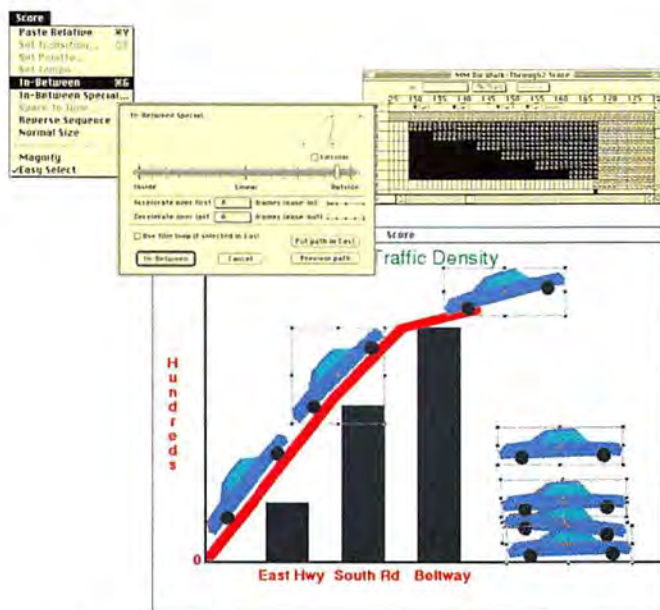
Only Double Helix lets you manage information exactly the way you choose, just by arranging simple visual objects right on the screen.



"Every morning when I turn on my computer, I want to automatically send a letter to everyone I saw 6 months ago."

Double Helix.

Animation



Director: Make a heap of cars
Cars will climb the line and leap off onto a growing stack. One car was hand-done, and rotated copies were created automatically by Director's Auto Transform feature. The set of rotated cars was dubbed a film loop, and it was tweened by definition of four key positions. After tweening, the developed event in the score was pasted into other channels, a few frames apart, producing multiple staggered climbing sequences.



Director: Add more with Overview
In Director's Overview mode, you can assemble a custom presentation from existing animations and stills, and then add audio, textual, color, and transition effects. Here, the graph movie produced earlier is preceded by the sound of decelerating machinery, a short delay, and a venetian-blind transition. The show ends with a built-in sliding-text effect on a blue background.

and they're relatively easy to learn and use.

The most common need is to rearrange the order of presentation. By dragging a document icon to a new position, you can change the order of slides or the order in which items appear on a given slide. To help smooth the presentation and highlight key slides, you may use one of the built-in, customizable transition effects, such as fade or dissolve.

Sounds, such as music and lifelike speech, can emphasize particular slides or change the tempo of a presentation, but they might also cause problems — a slide might advance before a playing sound ends, for example. To ensure that the current scene will be displayed until the end of a sound, you must adjust the length of time the slide will be on the screen. Director uses stopwatch icons to time events. After you install one, you can set and change its time to whatever duration is needed.

Call Your Editor

The Launch Editor is a valuable shortcut for changing documents in your show. It bypasses the Finder and takes you directly into the program that created the document. Highlight the document and select Launch Editor from the File menu. Once you've made the changes, save the document and quit the program — you'll return to the Overview window, where your changes will be automatically reflected.

Fortunately, an Overview document doesn't actually contain its component documents — it serves as a table of contents for the presentation and has links to the elements, wherever they are. One document, such as a background, logo, or animation, can be used by more than one Overview document. Even though the Overview remembers where its component documents are on any mounted disks, it's a good practice to put all the documents into one folder. Director can even do this for you with its Gather Documents option.

Universal Studio

Director's Studio mode puts you closer to the back-room details of animation. It's a stage and movable-character animator in which movie frames are built from image layers — similarly to conventional animation. You draw characters or parts of characters onto individual transparent overlays and then stack them in the appropriate order for viewing.

Director supplies a full-featured painting environment for creating and editing the elements of the animation. Each element is a free-floating, separately controllable object, which makes a movie much easier to manage and change.

THE MOST INGENUOUS PORTABLE PRINTER SINCE THE PENCIL.

Most computer printers are sentenced by their own sheer bulk to lifelong confinement on a desktop.

But now GCC Technologies™ has created a printer for the Macintosh® with con-

you get much higher print quality than the ImageWriter® II, for not much more money.

All of this has obvious consequences for the highly mobile. Since WriteMove works off rechargeable batteries, you will

day via overnight delivery for only \$9.

If after trying WriteMove for up to 30 days you aren't completely satisfied, just return the printer and we'll cheerfully refund your money, no questions asked.



siderably more freedom than that. It's called WriteMove:™ the "biggest" printer ever to come in an incredibly small package.

WriteMove weighs a scant three lbs. It measures just 2"x6 1/2"x10 3/4". (Any smaller and you couldn't get the paper in.)

But it's the only ink jet printer of any size that gives you unlimited freedom to reduce and enlarge both type and documents. Because it's the only one with outline fonts—imaging software that provides functionality usually associated with laser printers.

High Quality Output, To Go.

As a result, you can use WriteMove to compose documents with word processing software like Microsoft® Word, or Excel.

And then silently print them out on cut sheet or fanfold paper at 192-dpi resolution. So,

In Canada, (800) 263-1405 © 1989 GCC Technologies, Inc.

have direct access to letter-quality output on airplanes, in hotel rooms or even at that popular weekend workstation called home.

Which could bring a whole new meaning to the phrase "freedom of the press."

To exercise that freedom, use the number below to order WriteMove today. Or ask for the authorized GCC Technologies dealer nearest you. Here's how.

Toll-Free, Hassle-Free, Risk-Free.

To order just call 800-422-7777 from 9 to 9 on weekdays, or 10 to 4 on Saturdays. Our expertly trained staff will be glad to answer questions, provide technical support, and offer advice on choosing and getting the most out of any of our products. Ask for our free catalog. When your order is received by 8:00 PM (EST), it will be shipped the same

One Year Warranty.

Finally, WriteMove carries a full one year warranty covering both parts and labor. We also offer repair service at any one of hundreds of GCC dealers.

WriteMove Portable Printer \$579.

For the name of the authorized GCC Technologies dealer nearest you, or

To Order, Call 800-422-7777.

We are glad to accept MasterCard, Visa, American Express, or your company's corporate purchase order.

 **GCC TECHNOLOGIES**
Peripherals With Vision.™

Please circle 97 on reader service card.

Painting the Picture

Director paints in both black-and-white and 8-bit color. Although it's not immediately apparent, the program's bit-mapped-graphics power is on a par with that of the higher-end Macintosh color paint programs. It has the standard tools, including a widely configurable airbrush; special effects such as graduated fills, free rotation, perspective, and distortion; and a nearly unlimited variety of special paint effects such as lighten, darken, and blend, the degree of which can be user-specified.

Each painted object has an invisible registration point that helps line it up with preceding objects during playback. Director also has tools for rendering basic QuickDraw shapes that can serve as memory-efficient background objects and animated elements with special object properties.

All the World's a Stage

The *stage*, *cast*, and *score* are the metaphors of a Director animation. The stage is where the action occurs. Any created or imported graphic is automatically placed in the cast and considered a *castmember*. Director gives each castmember a short identifier for referencing and managing purposes. The Cast window is like a set of dressing rooms, where all the actors wait, ready to go onstage. Unlike real theater, however, Director lets you have multiple copies of the same castmember onstage simultaneously, each in a different location, stacking order, and size.

The score is a script — a to-do list that controls the location, stacking order, apparent size, and other attributes of each castmember, plus the start of transitions and sound effects. Like a 24-channel tape deck, it can control

up to 24 simultaneous activities in each movie frame. Objects controlled by higher-numbered channels pass in front of objects in lower-numbered channels. Four additional channels control sound, film speed, palette changes, and transitions such as fades and dissolves.

Events recorded in the score can be copied and pasted from one part to another like spreadsheet cells. This system makes it easy to set up complex motion, change the location or synchronization of events, or alter the stacking order of castmembers — all without error-prone manual tweaks to the graphics themselves. Hundreds of frames can be dealt with as easily as one. Double hats off to MacroMind on that one.

To include a castmember in the action, you select the channel and frame number where its action will begin and then drag the castmember from the cast and place it on the stage. Director automatically annotates the score. Once your object is on the stage, you can drag it around while Director records its movement or move it incrementally and advance one frame each shift, or have Director tween it to your specifications. Although its tweening function is strictly 2-D, it can produce straight or curved paths between two or more

Glossary



Tweening

Tweening is easily the most important capability in animation software. To move an object smoothly along a path through successive frames, you can either draw that object by hand in each frame or have your trusty animator automatically do it. You specify the starting position of the object in one frame and its ending position in a later frame. The program automatically creates a specified quantity of frames in *between* your two key frames, with the object precisely displaced in each. It's a priceless and essential power tool. Both Director and Studio/1 offer tweening, but each has its own methods, options, and extensions.

complex motion, such as a bird flapping its wings and flying across the screen.



Frame

An instant in a movie. New things happen only when there's a change of frame. Characters appear, disappear, shift, or change shape, size, or color. You synchronize the actions of animated items by using the frame number as a reference.



Key Frame

A frame that is specified as the starting or ending point for a gradual movement or change.



Cel or Cell

A cel is one layer of a frame of animation. The word has its roots in the clear, transparent sheets that are stacked to form a complete frame in conventional animation.

PICS

A generic animation file format that contains sequential frames. Animation-capable programs that can read PICS files include VideoWorks II, Director, Studio/1, SuperCard, and some utility programs that are like play-only movie projectors.



Film Loop

Any repetitive motion, such as the walking of legs, swinging of arms, or spinning of wheels, is like a length of film with the ends glued together to form a *loop*. Director and Studio/1 each offer this capability. Moving and tweening a loop are as easy as moving and tweening an object, but loops produce

Real-Time Animation

An animation mode in which an object is dragged with the mouse and its path automatically recorded for later playback.

Transition

A gradual change from one view to the next. Examples are fade-ins, fade-outs, dissolves, leftward slides, venetian blinds, and checkerboards. — Salvatore Parascandolo

THE HARD DISKS THAT SURVIVED HARD DISK HELL.

Practically all hard disks perform well under ideal conditions. UltraDrive™ hard disks are designed to perform well in a far less hospitable environment. A world we've duplicated at the industry's most

file recovery, DES security, and backup.

You also get UltraWare™, including a disk management program featuring true SCSI partitioning (DiskManager™), a rapid print spooler (QuickSpool™), and over

Two Year Warranty.

Finally, UltraDrive carries a full two year warranty on parts and labor (ask for details). We also offer repair service



grueling proving ground for hard disks.

The GCC School Of Hard Knocks.

In the design stage, we shock components and assembled hard disks in both operating and non-operating states. Next, vibration tests mimic the jostling of car, truck and air transport.

Then, we drop our disks over 20 times from varying heights in varying operating and non-operating states on every face and edge. They're exposed to a wide range of humidity and temperatures—from 122° to -40°F. And finally, every hard disk is burned-in for 14 hours before shipment.

All of these proven hard disks come with a generous software library which normally retails for several hundred dollars. Including Symantec's® SUM II, a utilities package featuring data recovery, deleted

3 MB of selected shareware software.

But UltraDrive hard disks don't just work longer and smarter than others, they also cost less. In fact, the UltraDrive series is priced up to 50% less than Apple's®

Toll-Free, Hassle-Free, Risk-Free.

To order your internal or external UltraDrive, call 800-422-7777 from 9 to 9 on weekdays, or 10 to 4 on Saturdays. Our expertly trained staff is glad to answer questions, provide technical support, and offer advice on choosing any of our products. Ask for our free catalog.

When your order is received by 8 PM (EST), it will be shipped the same day via overnight delivery for only \$9.

UltraDrive comes with a 30 day money-back guarantee. Just return your hard disk for a full refund, no questions asked.

at any one of hundreds of GCC dealers.

The UltraDrive Family.

MODEL	EXTERNAL	INTERNAL
UltraDrive 20.....	\$549	NA
UltraDrive 30.....	\$629	\$529
UltraDrive 45.....	\$699	\$599
UltraDrive 80.....	\$949	\$849
UltraDrive 155.....	\$1499	\$1399

For the name of the authorized GCC Technologies dealer nearest you, or

To Order, Call 800-422-7777.

We are glad to accept MasterCard, Visa, American Express, or your company's corporate purchase order.

 **GCC**
TECHNOLOGIES
Peripherals With Vision™

Animation

key frames. You can vary the type of path curvature, as well as the acceleration and deceleration of the tweened object.

If you don't mind the characters' having a Swedish accent, they can even talk, using MacInTalk speech, which is text that has been converted to spoken English. You can import and play digitized sounds and music or pass timing cues to a MIDI sequencer (which can be another Macintosh) that drives one or more musical instruments.

Occasionally in theater, one actor takes over a role from another. The role remains the same, but someone else goes through the motions. You can do the same with Director's castmembers. You select the piece of the score that describes the path of castmember X, select castmember Y from the cast, and choose Switch Castmember from the menu. Poof! Instant understudy. You can replace, for example, an older model of a demo product with a newer model.

To obtain such effects as revolving

Different Kinds of Animation

Painted Frame by Painted Frame

This is simple flip-book animation. The background, characters, props — everything you see in a frame — is one painting. Editing can involve slow and intricate work in repositioning items and patching holes. This type of animation can play back at high speeds, regardless of the complexity of the scene, but generally it uses up substantial disk space.

Stage and Movable- Character Animation

Everything floats and is not permanently attached to anything else. Even though most of the items can be bit maps, each bit map is treated as an individual object. So it's easier to do small positioning tweaks and major edits. The action slows as more animated elements are brought onstage. This type of animation produces relatively compact files. — Salvatore Parascandolo

titles, flashing signs, and shattering words, Director lets you create and animate bit-mapped text. Once set in place, it can't be edited as text. Permanent text is available. It can be animated or globally searched and replaced and have its attributes changed at any time. Special effects with permanent text are severely limited.

For some color magic, Director offers color cycling and palette transitions. Basically, cycling is a wave of color sweeping through an area. With it you can produce intricate

visuals such as shimmering oceans, flashing lights, and moving backgrounds, all in one frame. The palette transition is a gradual scenewide change from one color scheme to another. It can be used to mimic a sunset, sunrise, or weather changes or make other mood-altering shifts that can enhance a presentation.

To manage an animation project better, you can attach comments to any frame to note important changes in the action, characters' entrances and exits, names of sounds, plans for future action, or notes to other mem-

3-D Animation: Super3D and Swivel3D

In its true sense, 3-D animation is somewhat like clay animation. Currently, several modeling applications provide it. Some have features for simplifying both the creation and recording of frames. These applications manipulate objects in fully law-abiding 3-D space. You can rotate an item and see its previously hidden sides. There are true perspective and realistic lighting effects, with no need for mental calculation or guesswork.

Super3D from Silicon Beach and Swivel3D from Paracomp are two widely used world makers. They can create complex shaded renderings; execute tweening; and export frames as either Scrapbook pages, sets of individual files, or PICS files. When a movie is exported in any of those forms, it loses its 3-D nature and becomes a series of sequential snapshots of the 3-D world. Both programs work in monochrome and color and provide a wide range of hues. They offer options such as wire-frame or

fully shaded display; extensive abilities to create, combine, and edit objects; and the ability to change the viewpoint on the world in both angle and magnification. Each can also build, modify, and animate a 3-D scene from simple text instructions. There are some important differences between these two programs, however.

Super3D's interface looks like that of an object-oriented drawing program. Objects have handles that can be used to stretch, compress, and reshape them. An object can be dismantled into its component polygons and the parts removed or replaced. The program can use multiple copies of a master object and automatically reshapes all the copies when the master is changed. You can even make all copies of a given master object invisible when you don't need them, which lets you powerfully control the contents of a scene without manually removing and adding items.

Swivel3D's interface is less orthodox but more natural. Screen redrawing is exception-

ally fast. You create an object by entering the construction mode and drawing the object's cross-section, side, and top views. You can reposition, resize, and spin objects by dragging them with the mouse with a modifier key depressed. Objects can be combined into swiveling, sliding, or locked mechanisms while retaining their editable individuality. Each object's pivot point can be set for more-natural motion. Swivel3D objects can cast real shadows, and colored images can be wrapped onto the curved surface of a 3-D object. A painted rocklike texture on a 3-D lump can add striking realism to your world.

Swivel3D costs \$395. Paracomp is located at 123 Townsend St., Suite 310, San Francisco, CA 94107; (415) 543-3848.

Super3D is priced at \$495. Silicon Beach Software can be contacted at 9770 Carrol Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

— Salvatore Parascandolo

THE \$1,699 PERSONAL LASERPRINTER. BECAUSE A DOCUMENT SHOULD REFLECT YOUR ASPIRATIONS. NOT YOUR SIZE.

At GCC Technologies,™ we believe high-quality laser printing should be available to the many, not just the mighty.

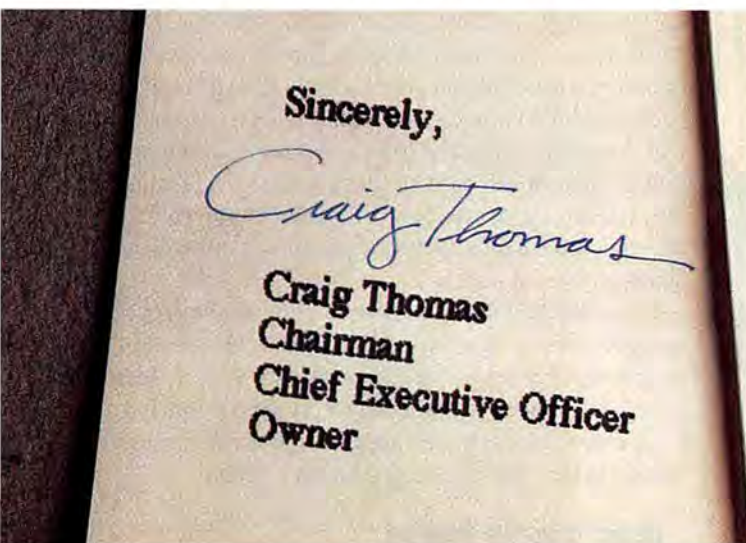
Which is why we created the Personal LaserPrinter™ (PLP™): the first QuickDraw™

fonts. All of which can be enlarged or reduced to any point size or fraction thereof.

Final output is quietly produced at 300 dpi resolution. (With rapid 75 and 150 dpi draft modes for works in progress.) And the

free catalog. When your order is received by 8:00 PM (EST), it will be shipped the same day via overnight delivery for only \$9.

What's more, we guarantee satisfaction. If after trying the PLP for up to 30 days



Sincerely,
Craig Thomas
Craig Thomas
Chairman
Chief Executive Officer
Owner

laser printer that does everything other laser printers do, except cost a lot of money.

The reason the PLP is so inexpensive is that instead of coming with its own memory and processor, it uses the hardware you already own: your Macintosh.®

Improve Your Appearance, Instantly.

With it, you can create near typeset quality newsletters, business plans and proposals using software like Microsoft® Word and Aldus® PageMaker.® Or manipulate eye-catching, scanned photographs and illustrations using graphics packages such as MacDraw® II and SuperPaint.®

The PLP includes 22 Bitstream® outline

PLP handles a variety of paper weights including envelopes and transparencies.

All of which means you'll finally be able to produce the kind of documents that get your ideas noticed, instead of ignored.

What's more, the PLP can grow as you do. A simple upgrade turns it into a PostScript® printer for high-level desktop publishing and use on a network. An enhanced version of the PLP, PLP Plus™ (\$1,899), offers 40 fonts.

In other words, the PLP can enjoy the same future you're planning to enjoy. A future that only awaits a call to the toll-free number below.

Toll-Free, Hassle-Free, Risk-Free.

To order, just call 800-422-7777 from 9 AM to 9 PM on weekdays, or 10 AM to 4

PM on Saturdays. Our expertly trained staff will be glad to answer any questions, provide technical support, and offer advice on choosing and getting the most out of any of our products. Ask for our

you aren't completely satisfied, just return the printer and we'll cheerfully refund your money, no questions asked.

One Year Warranty.

Finally, the PLP comes with a full one year warranty which covers both parts and labor. But that's not the only way we ensure your peace of mind. We also offer expert repair service at any Xerox® carry-in service center, or at any one of hundreds of authorized GCC Technologies dealers.

Personal LaserPrinter \$1,699.

For the name and location of the GCC Technologies dealer nearest you, or

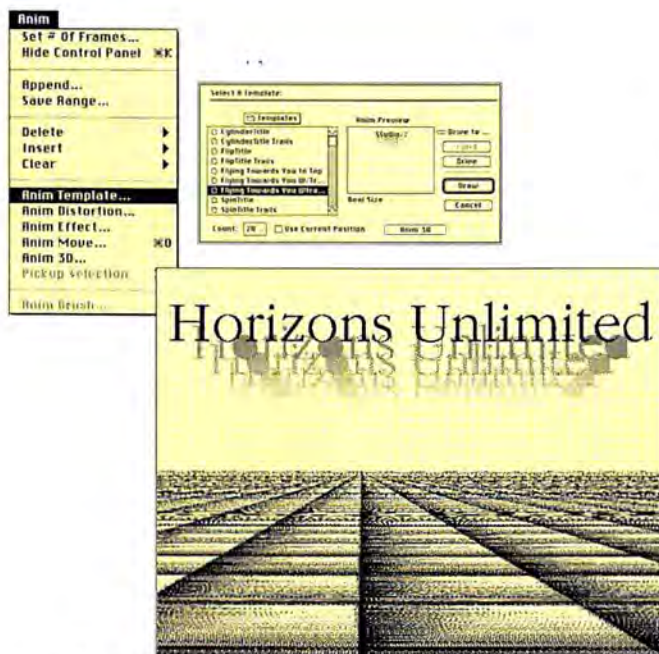
To Order, Call 800-422-7777.

We are glad to accept MasterCard, Visa, American Express or your company's corporate purchase order.

 **GCC**
TECHNOLOGIES
Peripherals With Vision.™

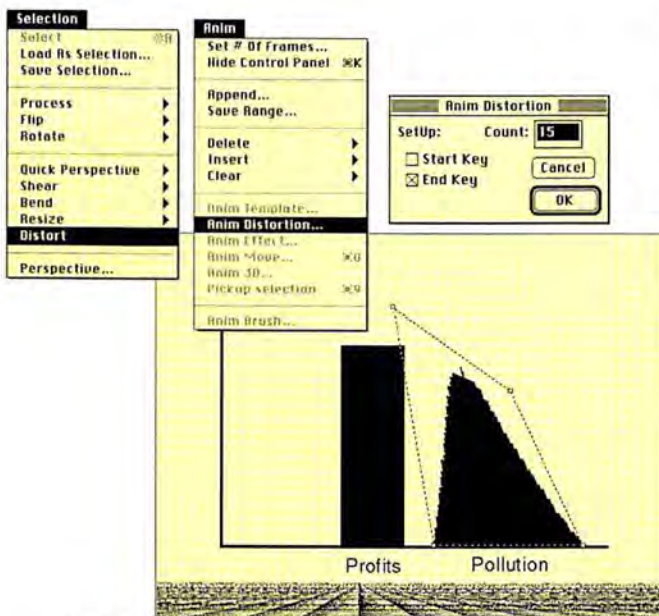


Animation



Studio/1: Set Up Flying Text

You select any text or image-area object and apply an animation effect to it. You can either specify starting and ending positions, using x,y,z-coordinates, or use one of the predefined animation templates that are included. As you browse for effects, the preview window shows an animated sample of the highlighted template. This one is a home brew. Trailing images are a built-in option.



Studio/1: Grow a Graph

Both the profits bar and the pollution pile were grown with tweened distortion. You select an area, opt to distort it, and then set up its beginning and ending shapes and the number of in-between frames. The profits bar was grown first, and then the pile began its growth after a two-second pause. After vertical growth, the pollution pile was further tween-distorted toward the profits bar.

bers of an animation team. Director offers a host of options for printing the elements of your animations. The printed forms can be used for such things as annotated presentation handouts, speaker notes, and storyboards.

Even on the fastest Mac, Director's playback slows when many characters are onstage. (Director itself takes up 1 megabyte in RAM; under MultiFinder, the default partition is 2 megabytes.) With Director's Accelerate option, you can convert your movie to a form that can play back at up to 30 frames per second. The conversion will cost you disk space — a 200K color movie can convert into a multimegabyte disk-blockbuster. Large movies also require substantial RAM for smooth playback, but the smoothness adds to the presentation's effectiveness and professional punch.

Out of the box, Director is not an interactive program as HyperCard is. You can't, for example, push a button to decide which animation sequence plays next. But MacroMind offers a way to join Director's talents with HyperCard's navigational nimbleness. This subject is discussed further in the "Interactive Animation" sidebar.

Direct from the Desktop

Director is a professional tool that lets you easily add interest and clarity to conventional graphics. With its Overview mode, you can hit the ground running — assembling a custom presentation in minutes from existing components. In the Studio mode, you can import or create simple or sophisticated graphics, and you have the means to create plain or complex motion. You won't instantly become Walt Disney or produce a space-shuttle simulation in your first five minutes, but with experience and experimentation, you can be a prime mover.

4 The Little Studio That Could

Studio/1 has two basic talents: It's a full-featured monochrome painting program and a painted-frame animator. Its tool sets are complete and rich with intelligent options, shortcuts, and special effects — and they're easy to use.

Studio/1 can be used for low- or high-resolution painting, scanning and editing 1-bit TIFF images at resolutions of up to 300 dpi, obtaining dynamic titling effects, illustrating mechanisms and processes, or producing action segments that can be played back from within Director or by HyperCard or SuperCard under interactive control (see "Interactive Animation" sidebar).

The program shows obvious efforts to overcome some inherent limitations of paint-only animation. For example, new objects and selections can temporarily float above the painted background. While floating, an object

FOR THOSE OBSESSED WITH PERFORMANCE, A HARD DISK THAT MATCHES YOUR OBSESSION.

Today there are any number of peripherals designed to push the performance envelope of the Macintosh.[®] But none pushes harder than an ingenious new series of hard disks from GCC Technologies.[™]

utilities package featuring data recovery, deleted file recovery, DES encryption security, and a powerful backup program.

You also get UltraWare,[™] GCC's own software package which includes a disk

return it and we'll cheerfully refund your money, no questions asked.

Two Year Warranty.

Finally, UltraDrive S carries a full two



Its name is UltraDrive[™] S: a complete family of 40 to 175 MB hard disks that relegates all others to the status of underachievers.

No Hard Disk Works Faster.

Simply stated, UltraDrive S is the fastest hard disk in its class. A distinction made possible by an on-board RAM cache that speeds access to recent or sequential data requests. By a capability called 'one-to-one interleaving' that feeds you data as fast as your Macintosh can take it. And by amazing average access times as low as 12 ms.

All of which is good news indeed for anyone who works with large spreadsheets, sophisticated graphics or other data-intensive applications.

No Hard Disk Works Smarter.

Each UltraDrive S hard disk comes with an extensive software library ordinarily retailing for several hundred dollars. Including Symantec's[®] SUM II, a comprehensive

management program featuring true SCSI partitioning (Disk Manager[™]), a rapid print spooler (QuickSpool[™]), and over 3 MB of selected shareware software.

In sum, to anyone obsessed with performance, UltraDrive S provides an ideal vehicle for self-expression. And at a price over 35% less than Apple's[®] hard disks, it even performs better as an investment.

Toll-Free, Hassle-Free, Risk-Free.

To order, call 800-422-7777 from 9 to 9 on weekdays, or 10 to 4 Saturdays. Our expertly trained staff will be glad to answer questions, provide technical support, and offer advice on choosing and getting the most out of any of our products. Ask for our free catalog. When your order is received by 8:00 PM (EST), it will be shipped the same day via overnight delivery for only \$9.

What's more, we *guarantee* satisfaction. If after trying UltraDrive S for up to 30 days you aren't completely satisfied, just

year warranty covering both parts and labor (ask for details). But that's not the only way we ensure your peace of mind. We also offer repair service at any one of hundreds of GCC Technologies dealers.

The UltraDrive S Series.

MODEL	EXTERNAL	INTERNAL
UltraDrive 40 S	\$799\$649
UltraDrive 80 S	\$1099\$949
UltraDrive 100 S	\$1299\$1149
UltraDrive 175S	\$1799\$1699

For the name and location of the GCC Technologies dealer nearest you, or

To Order, Call 800-422-7777.

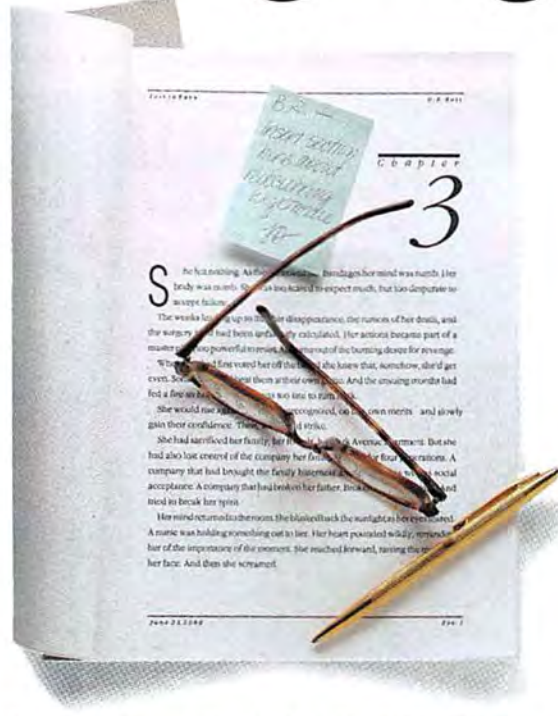
We are glad to accept MasterCard, Visa, American Express, or your company's corporate purchase order.

**GCC
TECHNOLOGIES**
Peripherals With Vision.[™]

For heavy users of the English language.



Anyone can create side-by-side paragraphs without having to worry about tabs. And you'll always find the right word—the thesaurus boasts 220,000 of them.



Documents 10,000 pages and longer won't intimidate Word. And Word Count gives authors an exact count of characters, words, lines and paragraphs.



Our formula typesetting feature can handle symbols and notations so you technical writers won't have to rely on a typesetter.



Absolute positioning of graphics and text is the absolute best if you're involved with page layout. The text wraps around any object as you type.

REMOVABLE. ERASABLE. OPTICAL. REMARKABLE!

REO-650 single-drive system
\$4,995

REO-1300 dual-drive system
\$9,990

650/600 Meg optical cartridges:
\$250 each

Interface kits for Macintosh,
Sun, HP, IBM-AT, XT, PS/2
and compatibles:
\$995 each

Pinnacle Micro delivered the first removable, erasable, optical storage systems for the Macintosh.

The REO-650 is a single drive, SCSI system. The REO-1300 is a dual-drive system. Up to 1.3 gigabytes of facts and figures at your fingertips!

Each optical cartridge holds up to 650 megabytes of precious memories. Graphics. CAD files. Databases. Images.


You can write, erase and rewrite data... file by file... a million times or more.

Interface kits give you the flexibility to use Pinnacle drives with the workstation of your choice: Macintosh, Sun, HP, IBM-XT, AT, PS/2 and compatibles.

Software provided with each kit supports a host of working environments: UNIX, Xenix, Novell Netware 2.1, and many more.

Removable, erasable, optical. The new standard in mass storage and file server technology. Available now from Pinnacle Micro.

Call today for the location of your sales representative or authorized dealer.

 (800) 553-7070

PINNACLE MICRO

Trademark owners: REO-650, REO-1300 and Pinnacle Micro of Pinnacle Micro, Inc. Sun of Sun Microsystems, HP of Hewlett Packard, AT, Xenix, IBM, PS/2 of International Business Machines Corporation, Netware of Novell, Macintosh of Apple Computer Inc.

Please circle 30 on reader service card.

15265 Alton Parkway • Irvine, CA 92718 • In CA (714) 727-3300 • FAX (714) 727-1913

Programs Plus



Swivel 3D by Paracomp

Swivel 3D, a fast, full featured 3D color drawing/modeling program. **Swivel 3D** ("1988 Hot Product": MacWeek: "Five Mice": MacUser 3/89) easily creates dramatic images for desktop publishing, presentation, illustration, animation and design. Link objects together for realistic movement and animated sequences. Includes a packed 'Image Library' and supports the MacPlus thru IICx. **\$245.**

MODEMS

Abaton InterFax 12/48	325.	MacCompack (2400SA w/Microphone & Cable)	225.
Anchor Automation MacPac 2400E w/software & cable	179.	Prometheus Promodem 2400M Ext. (Software & Cable)	215.
Best Data Products SmartOne 2400/1200 w/software & cable	145.	Promodem 2400SE Int.	199.
CMS CMS 2400BMX	179.	Promodem 2400MII (II, IICx)	269.
Hayes Microcomputing Smartmodem 1200	295.	Supra Corporation Supra Modem 2400	149.
Smartmodem 2400M w/smartcom II	459.	U.S. Robotics Courier 1200 (Hayes Compatible)	199.
Practical Peripherals Practical Modem Mini 1200SA	77.	Courier 2400 (Hayes Compatible)	335.
Practical Modem 2400SA	179.	Ven-tel Mac2400E (Int. Mac II w/MS Works)	369.



Electronic Word Finder by Microlytics, Inc.

Word Finder, the undisputed standard in thesaurus programs for the Macintosh now can go with you anywhere. The 4½ megabyte, 220,000 thesaurus and 110,000 spelling dictionary that fits in your pocket. **\$59.**

NETWORKING SOFTWARE & HARDWARE

CE Software Quick Mail 1-10 users 2.0	259.	Shiva NetModem V2400	479.
Dove FastNet III or FastNet SE	375.	Net Serial X232	289.
FastNet SCSI	779.	Net Bridge or TeleBridge	349.
Farrallon PhoneNET AppleTalk	9.	Tactic Software Clip Share	109.
PhoneNET Din 8 or DB9	35.	TOPS	
Timbuktu	65.	Tops 2.1 Mac	149.
TrafficWatch	139.	Tops Dos or Net Print	119.
Timbuktu Remote	195.	Tops FlashBox	125.
LaCie Silverserver	89.	Tops Repeater	129.
Magnus FileMagic	65.	Tops FlashCard	169.
Microsoft Microsoft Mail 1-4 users	195.	InBox-MacConnection	45.
Nuvotech TurboNet ST (Din8 or DB9)	30.	InBox-Starter Kit	149.
Olduvai Software Font Sharer	149.	Tops Teleconnector Din8 or DB9	39.



GOfer by Microlytics, Inc.

GOfer is the ultimate desk accessory for finding hidden facts. Give **GOfer** a phrase, fact or date and send him looking through floppies, hard disks, ram disks and most networks. Search for up to eight items simultaneously. **GOfer** allows you to view, cut and paste. Multifinder and Hypercard compatible plus AND, OR, NOT and Nearby search criteria. **GOfer** a real find. **\$47.**

PRINTERS & DIGITIZERS

Digital Vision Computer Eyes-Mac	209.	LogiTech ScanMan	349.
Koala Technologies Corp. MacVision 2.0 (Digitizer)	219.	Seikosha SP1000 (Imagewriter comp.)	235.
Mac Director	109.	Summagraphics Bit Pad Plus	325.
Kurta IS ADB Tablet	255.	ThunderWare ThunderScan	189.
Cordless 4 Button Cursor	65.	LightningScan	409.
		Mac II Power Accessory	42.



DAtabase by Preferred Publishers

DAtabase can file any type of data you create with your Mac. Color pictures, text and forms may all be stored, and they are all available at your fingertips! Perfect for people who do not require a large sophisticated database. **\$75.**

EDUCATIONAL/CREATIVE SOFTWARE

Ars Nova Practica Musica 2.1	75.	Electronic Arts Mavis Beacon Typing	33.
Barron's Barron's SAT	35.	Deluxe Music Construction Set V2.5	84.
Bogas Productions String Quartet, Country or Heavy Metal	14.	First Byte	
Super Studio Session	69.	Dinosaur Discovery Kit, Puzzle	27.
Bright Star Technology Alphabet Blocks	32.	Storybook or Rhyming NoteBook	26.
Talking Tiles	69.	Great Wave Software KidsTime	27.
Broderbund Sensei Geometry, Calculus or Physics	59.	Number Maze	27.
Type!	20.	Crystal Paint	27.
Where in the World is Carmen SanDiego?	27.	Individual Typing Instructor Encore	26.
Where in the USA is Carmen SanDiego?	30.	Learning Company Reader Rabbit	32.
Coda Mac Drums	31.	Mindscape Perfect Score SAT	46.
Perceive	50.	w/The Perfect College	28.
Davidson & Associates Speed Reader II	36.	Nordic MacKids Educational Prog. (ea)	35.
Math Blaster or Word Attack!	27.	Simon & Schuster Typing Tutor IV	59.
		Springboard Top Honors	28.
		Family Matters or Atlas Explorer	28.



MacSnap Memory Boards by Dove Computer

It's a safe bet that no matter what Macintosh model you have, Dove Computer has a **MacSnap** memory expansion product that matches your needs. That's because Dove has an extensive line of high quality memory and productivity enhancement products available. All models listed include Dove's RamSnap software, their intelligent ram management software. We've selected some of the most popular models.

BUSINESS SOFTWARE

Abacus Concepts StatView II (Mac+, SE, II w/68020 & 68881)	295.	Microsoft Microsoft Works 2.0	189.
StatView SE+ Graphics	225.	Microsoft Excel 1.5	255.
A.E.C. FastTrack Schedule	115.	Nolo Press WillMaker 3.0	32.
AEC Information Manager	409.	For the Record	29.
Ashlon Tate Full Impact	249.	Paracomp Milo	159.
BrainPower ArchiText	175.	Power Up Fast Forms	Special 89.
Casady & Greene A.C.E. (Access Control Environment)	Call	Calendar Creator	Special 89.
Chang Laboratories C.A.T.	229.	Pro Plus WallStreet Investor V3.0	469.
MacCalc	83.	Satori Software Bulk Mailer 3.2	78.
Clarix MacProject II	379.	Bulk Mailer Plus	189.
Smartform Designer	309.	Select Micro Systems, Inc. Exstatix	215.
Individual 101 Macros For Excel	37.	MapMaker	215.
Mainstay Capture	49.	SoftView MacInUse	42.
Mac Flow 3.0	125.	Form Set Business Forms	55.
Mac Schedule	115.	Synex Mac Envelope 4.10	55.
Meta Software MetaDesign	199.	Mac Invoice	29.
Micro Planning International Micro Planner 6.0	325.	Systat	
		Systat 3.2	
		(Specify MacPlus, SE or Mac II)	459.
		Fastat	165.

Overnight \$3



Simply Accounting by Computer Associates

Simply Accounting, for small to medium size businesses, is sophisticated enough to please CPA's but simple enough to allow accounting and computer neophytes the power of a full accounting program. Includes general ledger, accounts payable, accounts receivable, payroll (50 state and federal tax schedules built-in), inventory and jobcost. It received a 7.9 rating from Infoworld and four mice from MacUser. **\$209.**

DESK ACCESSORY PROGRAMS

Affinity Microsystems Tempo II	89.	Jam Software	
Affinitile	45.	Smart Alarms w/Appt. Diary	65.
Casady & Greene, Inc.		Multi-User Appt. Diary w/Smart Alarms	119.
QuickDex 1.4A	32.	Mainstay Think'n Time	59.
CE Software DiskTop	32.	Solutions, International Super Glue II	62.
Deneba Software		SmartScrap & The Clipper V2.0	46.
Comment 2.0	59.	Symmetry HyperDA (Req. 512K)	35.
Icom Simulations MacKern	119.		



MAC-101 Keyboard by DataDesk

Replace your Mac's keyboard with the **MAC-101** by DataDesk. The positive tactile, firm feel 101 includes a full numeric keypad, 15 function keys, 6 page control keys, and a T-style cursor pad. Includes 101-Keys desk accessory software, a powerful macro utility that allows you to exploit the full power of the function keys in almost any Mac application. Available in ADB and non-ADB versions. **\$145.**

SPELLING & GRAMMAR CHECKERS

Aegis Development		Microlytics, Inc.	
Doug Clapp's Word Tools 2nd Edition	42.	Word Finder (Synonym Finder)	36.
Deneba Software Big Thesaurus	59.	Electronic Word Finder	Special 59.
Spelling Coach 3.0 Professional	115.	Sensible Software	
Electronic Arts Thunder! II	52.	Sensible Grammar or BookEnds	53.
Lundeen & Associates WorksPlus Spell	46.	Working Software Spellswell 2.0	45.



Publish-It! by TimeWorks

Publish-It! is the first completely self-contained Desktop Publishing program for Macintosh computers. It allows both professional and non-professional business communicators to write, design and produce dynamic sophisticated documents — from simple in-house newsletters and business forms to full-length magazines and distinctive annual reports. And, do it faster and easier than ever before! **\$239.**

UTILITY SOFTWARE

Abbott Systems, Inc.		Kent Marsh MacSafe or KnightWatch	87.
CanOpener	Special 65.	MainStay AntiToxin or ClickPaste	65.
ALSoft Master Juggler	64.	Microlytics, Inc. GOfar	Special 47.
MultiDisk	49.	Microseeds INITPicker	27.
Disk Express	49.	Redux	52.
Font/DA Juggler Plus	42.	ScreenGems	42.
A.S.D. FileGuard	129.	Olduvai Software MultiClip	51.
Berkeley System Design Stepping Out II	52.	Read-It! O.C.R. Personal	99.
Beyond Inc. Menu Fonts 2	28.	Read-It! O.C.R. 2.1	245.
Central Point Software		PCPC HFS Back-Up 3.0	54.
Copy II Mac (Includes MacTools)	24.	SuperMac Software SuperSpool 5.0	53.
PC Tools Deluxe Mac	45.	SuperLaserSpool 2.0	79.
CE Software		Diskfit 1.5	53.
QuickKeys (Macro Program)	69.	Sentinel 2.0	89.
MockPackage Plus Utilities	32.	Symantec MacSQZ!	52.
Farallon Computing Screen Recorder	133.	Symantec Utilities for Mac (S.U.M.)	65.
Fifth Generation Systems Suitcase II	45.	Symantec AntiVirus for Mac (S.A.M.)	65.
FastBack II	109.	Tactic Software Icon-It!	39.
Power Station	35.	Williams & Macias DiskFinder	27.
Pyrol	15.	myDiskLabeler w/Color	29.
HJC Virex	69.	myDiskLabeler	
Icom Simulations On Cue	35.	w/LaserWriter Option	34.
Insight Development		StickyBusiness	99.
MacPrint	Special 79.	XTree Company XTree	52.

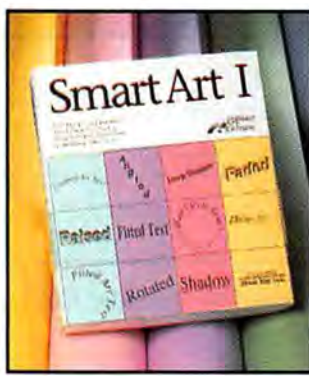


Managing Your Money by MECA

With **Managing Your Money**, you can write, print checks, set up a personal budget, estimate your taxes, set up a retirement plan, manage an investment portfolio, and calculate your net worth. **\$125.**

DATABASE MANAGEMENT

Acus 4th Dimension	349.	Generation Four Multiuser Business Administration Series (each)	115.
Activision		Microsoft Microsoft File 2.0	129.
Reports for HyperCard	69.	Odesta Double Helix II	339.
Focal Point & Business Class Bundle	49.	DataDesk Professional	285.
Apple Computer HyperCard	42.	GeoQuery	199.
Borland Reflex Plus	189.	Preferred Publishers	
Claris FileMaker II	229.	DAtabase	Special 75.
Exodus Retriever	59.	ProVUE Panorama	205.
Fox Software FoxBase+ V2.0	259.	Software Discoveries	
FoxBase+ Multi-User V2.0	365.	RecordHolderPlus	65.
FoxBase+ Runtime V2.0	155.		



Smart Art by Emerald City Software

Smart Art from Emerald City Software brings custom text effects to your favorite word processor, page layout or presentation program. With **Smart Art** you simply select one of the pre-programmed effects, customize it with the powerful, but simple controls, and place it in your document. **Smart Art** comes with the fifteen most wanted text effects for a word processor, desktop publishing and graphics design. **\$89.**



FAX: 203/381-9043
Inquiries: 203/378-3662
Canada: 1/800/344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497
1/800/832-3201

Programs Plus



Rags to Riches '3-Packs' by Chang Labs

Rags to Riches '3-Packs' offers the user flexible reporting, batch totals for any time period, user definable accounting cycles and impressive speed. As a special bonus, if you choose a '3-Pack' before June 30, *Programs Plus* will send you an Aatrix Payroll program, absolutely FREE! **General 3-Pack (G/L, A/R, A/P) (\$289), Pro 3-Pack (G/L, Pro. Bill., A/P) (\$359), Retail 3-Pack (G/L, Invent., A/P) (\$359).**

ACCOUNTING PACKAGES

Aatrix Software Aatrix TimeMinder	159.	Insight Expert INV or Time Billing	Special 409.
Aatrix Payroll Plus	159.	Insight Expert GL, AR, AP or Payroll	Special 409.
Chang Labs		MECA Managing Your Money	Special 125.
Rags to Riches Gen. 3-Pak 3.1 (GL/AR/AP)	Special 289.	Monogram	
Rags to Riches GL, AR, or AP	119.	Business Sense	279.
Check Mark MultiLedger	259.	Dollars & Sense 4.0	81.
Payroll	189.	Niles & Associates Grant Manager	249.
Cash Ledger	129.	Peachtree	
Computer Associates		Back To Basics Professional (GL/AR/AP/INV)	159.
Simply Accounting	Special 209.	Satori Software Components GL	369.
Dac Software Dac-Easy Light	42.	Survivor Software	
Intuit Quicken V1.5	Special Call	MacMoney 3.0 (Enhanced Ver.)	61.
Layered Insight One Write At Once!	125.		
	Special 295.		



atOnce! by Layered Inc.

atOnce! is the next generation in high-speed small business accounting. Included in one seamlessly integrated module are four full featured applications: General Ledger, Accounts Receivable w/Billing, Accounts Payable & Payroll. **\$295.**

COMMUNICATION SOFTWARE

Compuserve		Insigna SoftPC	249.
Compuserve Starter Kit	24.	Prometheus	
Compuserve Navigator	45.	MacKNOWLEDGE	Special 125.
DataViz		Software Ventures	
MacLink Plus/Translator	115.	Microphone II v3.0	219.
MacLink Plus with Cable	139.	Solutions, International BackFax	125.
Freemsoft		Synergy Software VersaTerm	89.
Red Ryder V10.3	54.	VersaTerm-Pro	179.
Hayes Smartcom II 3.1	88.	Traveling Software LAP-LINK	82.

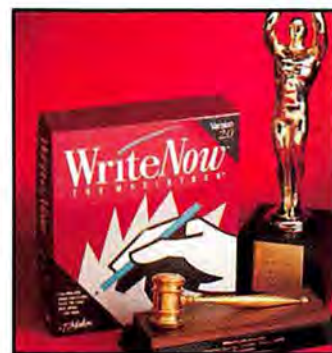


Fast Forms Version 1.2.1 by Power Up

With **Fast Forms** you can fill in your forms from within the Fast Forms application, or use the desk accessory that it comes with to quickly access, fill in and print forms. Just in case you need a little help getting started, **Fast Forms** also provides over 30 ready-to-use forms designs, including invoices, order forms and envelopes. **\$89.**

GRAPHICS SOFTWARE

3G Graphics		Electronic Arts Studio 8 (MacII)	309.
Images w/Impact Graphics & Symbols	52.	Studio 1	99.
Images w/Impact Business 1	65.	Enabling Technology Clip 3D (ea)	57.
Adobe Systems		Pro3D	285.
Adobe Illustrator 88	Special 299.	Generic Software Generic CADD	85.
Streamline	239.	Symbol Libraries:	Call
Adobe Collector's Ed. 2	139.	Graphsoft Mini Cad +	519.
Newsletters	249.	Blueprint	349.
Forms & Schedules	299.	Informix Wingz	259.
Presentations	299.	Innovative Data Design	
ITC Garamond (9)	125.	Residential Construction	139.
Helvetica Condensed (14)	239.	Dreams	269.
Stencil, Hobo, Brush (33)	95.	MacDraft 1.2B	145.
Life (83)	95.	Letraset ImageStudio 1.5	275.
Concord (84)	125.	MacroMind MacroMind Director	449.
Gothic 13/Tempo (85)	95.	MathSoft MathCAD	309.
Adobe Fonts (Various volumes)	Call	Micro: Maps MacAtlas Hyper Atlas	64.
Aldus Freehand	349.	MacAtlas Professional	
Altsys Corp. Fontographer 2.2	229.	(PCT/MacDraw Version)	129.
Fontastic Plus 2.0 or KeyMaster	52.	Microsoft Microsoft PowerPoint 2.1	255.



WriteNow 2.0 by T/Maker

WriteNow 2.0 is the long-awaited update of the easy-to-use, easy-to-learn, powerful word processor from T/Maker. The features added to **WriteNow 2.0** include a 100,000 word dictionary and spelling checker, WYSIWYG multiple columns, and graphic support, an unlimited number of open documents, and count for characters, words and paragraphs, and mail merge. **\$109.**

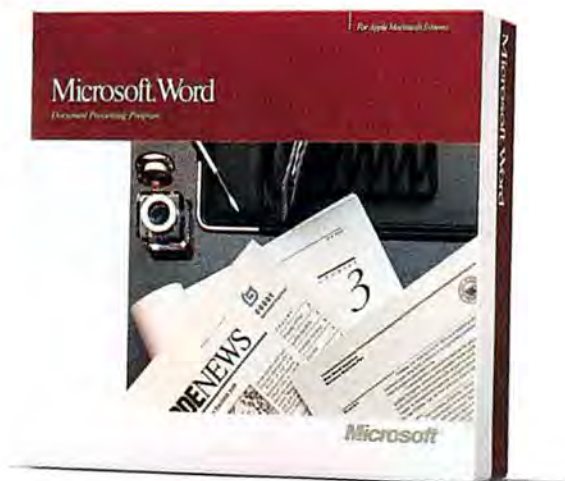
Ashton Tate Full Paint	67.	Micro Spot MacInteriors	Special 199.
Broderbund Print Shop	35.	MacPlot Series:	Call
Drawing Tables	75.	Miles Computing	
Casady & Greene Vivid Impressions	69.	Mac the Ripper or Orchestra of Fonts	32.
Quill Pack (vol. 8 & 20)	105.	People, Places-Things or Taking	
Headline Pack (vol. 10-12)	145.	Care of Business	32.
Modern Pack (vol. 7, 14-18) or Distinctive Pack (vol. 8, 19-22)	195.	NuEquation Nu Paint	95.
Classic Pack (vol. 3-6, & 13)	195.	Paracomp Swivel 3D	Special 245.
CE Software Calendar Maker	32.	Model Shop	379.
Claris MacPaint II	99.	Silicon Beach Software SuperCard	129.
MacDraw II	309.	SuperPaint 2.0	129.
Claris Cad	625.	Digital Darkroom	195.
Cricket Software Cricket Draw	167.	Super 3D 2.0	325.
Cricket Paint	95.	Solutions International	
Pictograph	85.	The Curator (Catalog Your Art)	75.
Cricket Graph	115.	Springboard Certificate Maker	24.
Cricket Color Paint	179.	Springboard Publisher	109.
Cricket Presents	289.	SuperMac Software	
Deneba Software Canvas 2.0 (Includes Desk Accessory)	159.	Pixel Paint Professional	Special Call
Dream Maker		Symmetry	
MacGallery (Hypercard or Paint)	27.	Picture Base & Wet Paint Bundle	79.
Clutures (vol. 1 or vol. 2)	85.	Synergy KaleidaGraph	119.
Dubl-Click Software World Class Fonts: Various Vol. 1-8 (ea)	45.	Tactic Software Art Clip vol 2	69.
World Class Lasertype: Various Vol. 1-6 (ea)	45.	Art Clip or ArtFonts 1, 2 or 3	55.
WetPaint: Various Vol. 1-18 (ea)	45.	TimeWorks Publish-It!	Special 239.
		T/Maker Christian Images	35.
		ClickArt EPS Illustrations or EPS Business Art	75.
		Zedcor DeskPaint 2.0	69.



Macinware SE Carrying Case by I/O Design

MacLuggage Macinware SE features a tear, soil and water resistant Cordura outer shell and ultra-high density foam. Compartments for your mouse, cords, extended keyboard and external hard drive. **\$75.**

A new Word.



The expression that you can't please all of the people all of the time just got redefined.

In developing Microsoft® Word version 4.0, we took input from the over 400,000 Word users who made Word the best-selling Macintosh® product in history. Added startling, cutting-edge technology. And the result is a gracious, easy-to-use word processing program with features as dynamic and diverse as its users.

Unleash those features, and you push the envelope of word processing. You can set up tables automatically, without worrying about tabs. Reformat an entire document with one command. And choose from four editing views—including one that shows you exactly what your document looks like, so you can organize and revise your documents without any guesswork.

What's more, Word is completely custom-

izable—any command can be placed on any menu or assigned any keyboard command.

And, software fans, the best-selling word processing program for the Macintosh now comes with the best-selling paint and draw program for the Macintosh—SuperPaint by Silicon Beach Software.™



And keep in mind Microsoft Word is part of an entire line of Microsoft products that work seamlessly together, so you can do more with your Macintosh.

Microsoft Word 4.0 can emphasize, articulate, clarify and organize your words. In fact, practically the only thing it can't do is think for you. Yet.

Microsoft®
Making it all make sense.

REMOVABLE DRIVE MODULES
30MB \$389*
70MB \$449*

44 REMOVABLE
\$995

OPTIONAL 5-YEAR WARRANTY

*** Requires Module Carrier...\$195.00**

Security and Acceleration

The DPI Security Line

If information is more precious than money, and in many instances it is; why not let DPI's new security line put your's under lock and key.

Our newest removable provides security, speed, and interchangeable modules, giving you the newest advances in removable hard drives.

So why limit yourself to fixed boundaries when you can take advantage of the newest technology available, "Removable modules."

With DPI's new security line your Data is always under lock and key.

Introducing SuperCharger/SE

The 16MHz 68000 based accelerator board that doubles the speed of your Macintosh SE. It's fully compatible with all Macintosh SE software, and can be turned off via the Control Panel for speed sensitive applications.

To take advantage of the new technologies in data storage and high-speed performance, call DPI. We offer a free technical support hotline and a 30-day, unconditional money-back guarantee. Improve your productivity with DPI, today. To order, call (800) 825-1850 and don't wait.



40 Corning Avenue, Milpitas, CA 95035 • FAX (408) 945-8148

(800) 825-1850 (408) 945-1850



Please circle 126 on reader service card.

*For a limited time only. Prices quoted are for cash purchases. Ca. residents add 7% sales tax. Shipping not included. SuperCharger/SE and Macintosh are registered trademarks of their respective companies. Prices subject to change without notice DPI 1989

can be moved harmlessly, and it can be the subject of special effects and sophisticated tweened motion. With sound synchronization, variable playback speeds, acceleration and deceleration, live recording of mouse-dragged objects, and sophisticated tweening, you have an impressive package for only \$150.

The Artist's Studio

Studio/1's painting tools are first-rate. In addition to the usual tools, the program features an editable Bezier curve and polygon, eight configurable airbrushes, and fully controllable gradient fills. It works at resolutions from 72 to 300 dpi and offers a separate layer for real text that remains editable and prints at the highest resolution of your printer. The ready access to high-quality text simplifies production of overhead slides, handouts, posters, and other mixed-media work.

Its selection tools include a free-form lasso, polygon, and rectangle. When combined with different selection modes, these tools let you quickly isolate parts of an image, which you can alter, using transformations such as rotation, perspective, bending, and free-form distortion. An area can even be masked to protect it from any editing action, including a full-document erase.

The *draft page*, a serious goof-reducer, is a spare work area that overlays the document and that can be painted like any other document. The draft page can be transparent so that you appear to be working over existing art without disturbing it. You can cut and paste items from the draft page or merge the entire draft page with the underlying document.

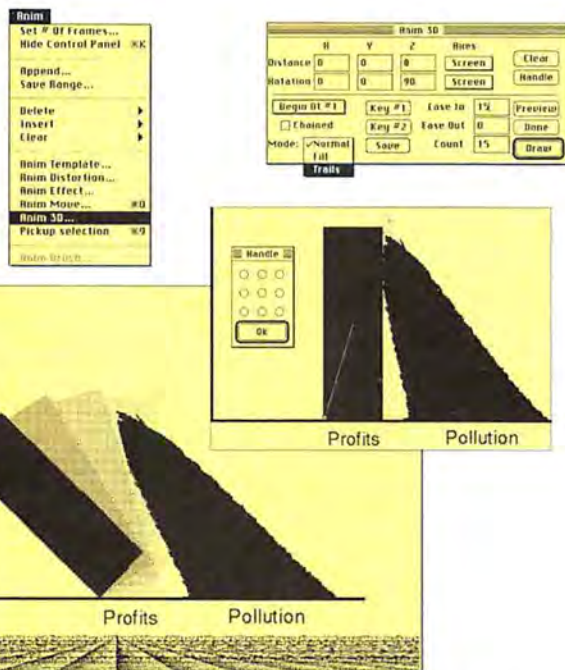
Your Anim Mate

Studio/1's extensive set of animation tools can help you pack plenty of movement, excitement, and entertainment into your frames. Studio/1 can tween motion, rotation, size changes, and distortions when supplied with the beginning and ending states of an item.

You may want a logo to revolve as if it were painted onto a slowly rotating cylinder, or you may need to send a propeller spinning off into the sunset along a diagonal path, going faster as it moves away. No sweat.

Although Studio/1's world is a flat, 2-D surface, Studio/1 can apply distortions, visual perspective, and scaling to objects as if they were moving in 3-D space. Because your object is only 2-D, it behaves like a paper cutout dancing in space. As it spins, you won't see its back faces come around. Even with this limitation, the effects can be quite striking.

You supply the data for tweened events through dialog boxes and by using the mouse. You then preview the



Studio/1: Tween a Falling Bar

The profits bar is going to be knocked over by the pollution pile. The bar's falling motion is a simple tween that's described numerically as a 90-degree z-axis rotation. Studio/1 lets you set the pivot point (handle) anywhere on screen. The lower left corner is appropriate in this case. You specify the number of tween frames and how many frames are to be used for acceleration. Here the Trails option produces a motion-blur effect.



Studio/1: Reuse an Animated Sequence

The animator constructed an animated brush earlier by drawing a bird at different stages of flapping in sequential frames that were saved as a named brush. In the Picture Preview window, the bird brush actually flaps. The brush was reconverted to a multiframe selection and 3-D-tweened many times. The key positions for each path were set numerically and by dragging. The result: independent birds, moving far and near at different speeds, in different directions.

THE RIGHT PRODUCTS

New products. To meet *your* needs. Mirror Technologies delivers more and better solutions.

For instance, we're the only company whose consultants can *objectively* guide you through four *completely different* removable media technologies. It's because we're the only company who *offers* four removable technologies. (See products, right.)

It all began with our first product – the ancestor of this little beauty. The RM.8 removable. It's an 800k floppy that reviewers

have loved for years. We've continued to improve it and *dropped* the price to \$147

We make buying convenient and risk-free. Pre-test the fastest, best-built, best-looking products on your computer for 30 days *without risk!* And get our Mirror extras, *FREE!**

THE RIGHT PRICES

Purchasing direct from Mirror Technologies means you **save up to 40%** by eliminating dealer mark-up. Compare quality. Compare features. Then compare price. You won't find a better source for Macintosh peripherals. Call us today and you could be computing by noon tomorrow. **

THE RIGHT COMPANY

Mirror Technologies is the oldest factory-direct supplier of Mac peripherals. You're buying our commitment to the Macintosh – we're in it for the long run.

You're also buying our commitment to service. We won't charge your card before shipping. We won't tack on rush charges. And, if you wish, we'll ship using Federal Express.

*We include embedded SCSI technology with external address selectors, EMI/RFI filtering, AC convenience outlet, heavy-duty power supply, whisper-quiet cooling fan, cables, Hard Driver™ formatting and diagnostics, backup and numerous other utilities. Ten Mb of public domain software is included with most drives. All M series drives ship preformatted, plug-and-play ready, and are protected by our two year limited warranty. All other products carry one year warranties.

**Optional express shipping.



Mirror Technologies RM42 Removable Drive. Big and Fast can also be Portable.

The RM42 is a 42 Mb removable-cartridge winchester drive that's as fast as traditional hard drives. The low cost per Mb is great for those who need larger capacity on a small easily-carried (or mailed) cartridge. The RM42 has many of the features of traditional hard drives, including auto head parking and self-diagnostics. It's the perfect size for backing up larger hard drives. The fast access speeds (25ms) make it a great choice for applications that access the disk more often.

RM42 42Mb Removable

\$897

Call today for latest prices!



Mirror Technologies External Drives. Reliability is Beautiful.

Mirror External drives combine the classic Mac look with extremely reliable hard drive technology. They are available in capacities from 20 to 200 Mb. "Plus" series drives bring you even greater speed. You also get all the extras people have come to expect from Mirror (see extras, below left.)

"Mirror Technologies has proven again that high performance doesn't have to be priced higher than a kite."

"... hundreds less than the competition. Factory-direct sales keep the price low." – MacGuide Magazine

20 Mb External

\$447

Call today for latest prices!

30Mb	\$497
40Mb	\$617
45Mb	\$567
60Mb	\$647
80Mb	\$717
100Mb	\$1077
30-200Mb Internals – Call	



Mirror Technologies RD Series Removable Drives. Our Largest and Fastest Removables.

The RD series combines the benefits of a removable with the potential for much greater capacity and increased speed. The RD removable series is actually a traditional sealed hard drive that's contained in a molded portable chassis. A turn of the security key and it pulls out of its power supply cabinet for transportation or safe storage. It is available in sizes from 30 to 200 Mb and speeds as fast as 15 ms. RD Series 30-200Mb Removables start as low as

\$797 Call today for latest prices!



Mirror Technologies Scanners. Eyes for your Macintosh.

Imagine giving your Macintosh the ability to see. Our VS300 works as a Desk Accessory and can scan line art, text and photos into the Macintosh at resolutions up to 300 dpi. If all you need is line-art, save with our 200 dpi scanner. Ask about our optional *ReadIt!* optical character recognition software by Olduvai that could put an end to re-typing documents.

"If it were my money, I'd buy the Mirror . . . Its price/performance ratio is unequalled." — BYTE

" . . . save a lot of money by looking into Mirror Technologies . . . hard to go wrong, and it can even scan small three-dimensional objects." — InfoWorld Magazine

VS200 200 dpi VS300 300 dpi \$797

\$597



Mirror Technologies RM20 Removable Drive. 20 Megabytes in your Pocket.

A 20Mb floppy drive, with all the advantages of floppy technology. The rigid plastic housing contains a magnetic medium virtually impervious to head crashes. Developed by Kodak/Verbatim, these disks are guaranteed for life! The RM20 is the safest way to back up data and is *extremely* inexpensive per Mb.

"Uses the same DTC drive as the Jasmine MegaDrive 20, although it costs \$100 less." — MacUser Magazine

" . . . faster than the Jasmine Drive." — MacUser Magazine

RM20 20Mb Removable
\$877

Call today for latest prices!

**MIRROR
TECHNOLOGIES**

**THE RIGHT NUMBER
1-800-654-5294**



2644 Patton Road, Roseville, MN 55113
Phone: 612-633-4450 Fax: 612-633-3136
Hours: Mon.-Fri. 8 a.m.-6 p.m. CST

Please circle 83 on reader service card.

Following are registered and unregistered trademarks or servicemarks of the companies listed:
Macintosh, Mac, Desk Accessory/Apple Computer, Inc.; Kodak, Verbatim/Eastman Kodak Co.;
ReadIt!/Olduvai Corporation; MacGuide Magazine/MacGuide Magazines, Inc.; BYTE/McGraw-Hill;
InfoWorld/IDG Communications, Inc.; MacUser/Ziff-Davis Publishing Company.



FileMaker II displays all the traits you look for in a great manager.

What do you look for in a great manager?

The ability to make your entire operation run smoother, faster, better is a must. You could use instant total recall. Plus the talent to make managing complex tasks incredibly easy.

A real team player. With great presentation skills. And a proven performer with impeccable references.

All for less than \$75K, a window office and a company Porsche.

Do a quick read on the resume above. Then call 408-727-8227 for your Claris dealer.

Because FileMaker II* is the one database manager that does everything you really want a database to do.

Perhaps reason enough to convince management the office and Porsche should be yours.

CLARIS

FileMaker II was formerly marketed as FileMaker 4. For FileMaker or FileMaker Plus upgrade information, call 800-544-8554.

© 1988 Claris Corporation, 5201 Patrick Henry Dr., Santa Clara, CA 95052. 408-987-7000. Claris is a trademark of Claris Corporation. FileMaker is a registered trademark of Claris Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Rolodex is a registered trademark of Insilco Corporation. For more information in Canada, call 800-668-8948

tween and adjust key frames. You may even specify the pivot point of an object so that rotations and other operations occur relative to that point rather than to the object's visual center.

If you feel too green to tween, Electronic Arts supplies a set of tweening-effects templates with proper x, y, and z start/end values already filled in. All you do is select a part of the drawing as the subject and go shopping for an effect. As you browse, you can automatically preview each effect's action. You can use the templates as they are, customize them, or make your own.

Studio/1's version of a film loop is the animated brush. You first produce several frames of animation, such as the poses of a flying bird. You then select the bird in all its frames

with a multiframe "cookie cutter" option and use the selection as a brush. As you move the brush across the screen in Recording mode, the frames play in a cycle, causing the bird to

flap its wings. When the sequence is played back, you see a bird flapping from one end of the screen to the other.

Sounds can be associated with any



MacroMind Director

Follows Mac Interface	5
Printed Documentation	5
On-Screen Help	5
Performance	5
Support	5
Consumer Value	5

Comments: Clearly the best-equipped tool for creating color Macintosh animations for demos, presentations and entertainment. **Best Features:** It can import, sequence, and orchestrate truly impressive audiovisual events. Its self-contained, object-oriented animation capabilities provide virtually limitless editing freedom. **Worst Feature:** Large or numerous objects onstage slow the action significantly. **List Price:** \$695. Published by MacroMind, Inc., 410 Townsend St., #408, San Francisco, CA 94107; (415) 442-0200. Version 1.0 reviewed. Requires Mac Plus or SE with two 800K drives for monochrome work, Mac II with hard disk and 2 megabytes or more of RAM for color productions, System 6.0.2 or later. Not copy-protected.

POWER

QuickKor

Proudly Introducing The
**NEW FIRST NAME in
POWER MAC PRODUCTS**

Macintosh IIx QuickKor

QuickKor
DESIGN LABS, INC.

WE ADD
SPEED, POWER
AND VALUE TO
YOUR MAC
PRODUCTS

WE'LL
SHIP YOUR
ORDER FAST!
CREDIT CARDS,
CODS AND
LEASES-OK!

COMPARE
OUR PRODUCTS,
ATTITUDE,
PRICING,
WARRANTIES
& SUPPORT!
WE'RE YOUR
MAC STORE

PostScript™
LASER PRINTERS

MONITORS

WIDE-CARRIAGE
PRINTERS

SCANNERS
MODEMS
& Much more!

SEE OUR
SYSTEM
PACKAGE AD
ON PAGE 175

Call our System Design Specialists
for a complete package
to meet your specific
computing needs!

**Mac
Friends**

Available
EXCLUSIVELY from
America's Largest
MAC ONLY STORE!

Call NOW
for complete system
package price quote!
**TOLL FREE 800#
331-1322**

© COMPUMART, INC. 1989 #7.2 DEALERS WELCOME

MAC, MACINTOSH™ APPLE COMPUTER, INC.
POSTSCRIPT™ ADOBE SYSTEMS, INC.

Please circle 86 on reader service card.

100 Popular Postscript Display Typefaces for the Mac.

One hundred Postscript Display typefaces for less than a dollar each ... and they're professionally created!

\$99⁹⁵ per set of 100 Display Typefaces.

Display type sets are supplied on 10 800K diskettes, 400K diskettes available at extra cost. Illustrator/Freehand outline EPS files, \$25 additional.

At ZIPATONE, Inc., we've been creating transfer lettering for design professionals for the past 35 years. So you know our standards are high.

We set out to make Postscript Display type affordable ... and we succeeded.



Outline EPS files for use with Illustrator or Freehand available for \$25 additional at time of order.

We've created what every Mac user wants: professionally executed Postscript display typefaces at an affordable price.

One hundred typefaces --- the first of 2,500 --- with proper spacing and proportions for \$99.95.

For an additional \$25, you can get EPS outline files for use in Illustrator or Freehand.

Here's what 45 of them look like:

ABCDabcd	ABCDabcd	ABCDabcd
ABCDabcd	ABCD	ABCD
ABCD	ABCDabcd	ABCDabcd
ABCDabcd	ABCD	ABCDabcd
ABCDabcd	ABCDabcd	ABCD
ABCDabcd	ABCDabcd	ABCD
ABCD	ABCD	ABCDabcd
ABCD	<i>ABCDabcd</i>	ABCDabcd
ABCDabcd	ABCD	ABCD
ABCDabcd	ABCDabcd	ABCD
ABCDabcd	ABCDabcd	ABCD
abcd	ABCDabcd	ABCD
<i>ABCDabcd</i>	ABCDabcd	ABCD
ABCDabcd	<i>ABCD</i>	ABCD
<i>ABCDabcd</i>	ABCDabcd	ABCD

Call us today to place your order. VISA and MasterCard accepted. Please add \$5. for UPS - Ground Shipping or \$8 for Overnight Air. All orders received by 1PM are shipped the same day.

TypeExpress

a marketing unit of ZIPATONE, Inc

1-800-343-4424

For same day shipping, call 1-800-323-0242 before 1PM CT
150 Fencel Lane Hillside, Illinois 60162

918 Classic Postscript Text Typefaces for the Mac.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

\$99⁹⁵ per type family
of 4, 5 or 7
weights.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

Type families supplied with Metrics Files
and over 1,000 kerned pairs. Fonts include
all English and Western European characters.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

Just about everyone who owns a Macintosh would love to have a massive library of professionally designed Postscript typefaces.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

But at prices ranging from \$45 to over a \$150 a font, who could afford a sizeable library?

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

We've made Postscript typefaces affordable.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

ZIPATONE, Inc. has been in the graphic arts industry for 75 years. You may know us as one of the major producers of dry transfer lettering.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

Each of the 145 TypeExpress type families consists of 4, 5 or 7 distinctive weights. Seven weight families range from Extra Light to Extra Bold.

We teamed up with Brendel Informatik GmbH, one of Europe's leading typographers, to lower the cost -- but not the quality -- of professionally designed Postscript typefaces.

Kiswaheli neumyx dok barcmope Re
itiz gofella queju vinre. Esni uz balomre
rhindupu doan, Neukifa in lenim dakai here
angru de sol. Olla gefeph russ nekoscha
kalain, hers dok in bulassa de jusselm
Regular

And we succeeded.

918 Postscript text typefaces arranged in 145 families.

Available today are 918 professionally designed Postscript typefaces, arranged in 145 type families. Designed primarily for body copy applications, they are equally handsome as display type.

A very special offer.

After November 30, 1989, our regular price will be \$24.95 per font.

As an introductory offer, all of our TypeExpress type families are available for only \$99.95 each. Families consist of 4, 5 or 7 typefaces of varying weights.

Call now for your FREE TypeExpress Catalog.

We can't show you all 918 Postscript typefaces in this ad.

But you can see all of them in our FREE catalog.
Call 1-800-343-4424 for your copy today!

POSTSCRIPT and Illustrator are registered trademarks of Adobe Systems, Inc.
Aldus Freehand is a registered trademark of Aldus Corporation.

Hard Bargain.

The easy decision has already been made: you're going to buy a hard disk drive. The more difficult question is which drive to buy.

Ehman would like to help make your decision easier by giving you an unbeatable bargain on a 30MB Hard Drive.

The best hard bargain in the industry. Just \$449 gives you Seagate technology and reliability, (the same drive that Apple uses), Ehman's reputation for quality and an obsession with efficiency and service.

And now that we're bundling our hard drives with "PC Tools Macintosh", you'll have all the utilities

PC Tools not included with 20MB drives.


you need to maximize your efficiency on the Mac. After all, you bought a Macintosh computer to help make you more efficient.

Ehman now helps you do it for less.

Ehman has been

a leading manufacturer of quality Macintosh peripherals since 1985, giving us advanced technical design skills, manufacturing expertise, and back-up service from skilled personnel.

That's a combination that's pretty hard to beat. But if you're still unconvinced that this is the best bargain you'll ever find on a hard drive, we'll give you 30 days to make up your mind. Purchase the drive, try it for 30 days and see if it isn't everything you've always wanted in a hard drive. If

 **Seagate**

it isn't you can return it to us with no questions asked. Add to that a two-year limited warranty and you've got an offer that's hard to pass up.

So don't. Call

1-800-257-1666, U.S.,
or 1-307-789-3830
Worldwide,
from 9 a.m.
to 9 p.m.

EST Monday-Saturday. Overnight delivery via Federal Express. Visa, Mastercard, and American Express welcome.

HARD DRIVE PRICES


Size (Mb)	Internal	External
20	\$329	\$399
30+	\$379	\$449
45	\$449	\$529
60+	\$499*	\$579
80+	\$599*	\$679
45MB Removable Drive		\$849



Ehman

1-800-257-1666



This is a very simple and easy to understand guarantee. If, for any reason, you are not satisfied with the performance of an Ehman Hard Drive, return it to us. We'll either refund your money, 100%, or we'll replace it. That's it. No other conditions or exceptions. We just want you to be satisfied. We're not interested in fine print, just a fine product. We gladly guarantee yours. 



SEE YOU AT MACWORLD
BOSTON
BOOTH NO. 521

*Good on Macintosh II models only. SE Drives also available. All product names mentioned are trademarks of their respective holder. Please circle 131 on reader service card.

800K

**Caution
Extinction
Ahead**



Moving Write Along

With the 1.4 Mb capacity of Apple's new, high-end computers and no upgrade for older computers, your Macintosh is becoming extinct. So, just throw it away and buy a new one.

Too extreme? Well PLI has the practical solution: the TurboFloppy 1.4.

TurboFloppy 1.4 gives you almost twice the data storage capacity of conventional floppy drives. It reads, writes and formats high-density 3.5" floppy diskettes for 1.44 MB capacity.

As an added feature, TurboFloppy 1.4 also reads 720k and 1.44 MB IBM disks.

Two time-saving utilities are included FREE: Turbo Cache, a disk accelerator using transparent caching for up to 300% increase in drive performance, and TurboBack, the fast and easy back-up application for people who don't like to back-up.

Avoid extinction with TurboFloppy 1.4.



Apple, Macintosh, IBM, and Insignia Soft PC, are trademarks of their respective companies.

Peripheral Land Incorporated
47421 Bayside Parkway, Fremont California 94538
(415) 657-2211 • FAX (415) 683-9713
Please circle 47 on reader service card.

For a Dealer nearest you call ...
(800) 288-8754

 **PLI**
PLI-MUSEAD-07


frame. You simply go to the frame where you want sound to start; click on the Sound button in the animation-control panel; and choose a sound, which can come from any file that has SND resources, such as the System file or a MacRecorder sound document.

Studio/1 imports MacPaint, PICT, TIFF, EPSF, and PICS files from applications such as Swivel3D, Super3D, and VideoWorks. It exports files in MacPaint, PICT, TIFF, and PICS formats. Its Open dialog has a time-saving thumbnail preview facility that lets you see single illustrations or multiframe animation documents. You can preview MacPaint, PICT, TIFF, PICS, and Studio/1 files. Animation files actually move during preview.

Final Frame

Studio/1 is an excellent and versatile black-and-white painting program

and capable animator. The painting and animation interfaces mesh well. With Studio/1's special effects, applied artistry, and time, you can produce animations of biblical propor-

tions, but when you plan to create big, complex projects, you'll want to migrate to MacroMind Director and use Studio/1 as a respected contributor to the production. 



Studio/1

★★★★½

Follows Mac Interface	5
Printed Documentation	5
On-Screen Help	3
Performance	4
Support	5
Consumer Value	4.5

Comments: An excellent monochrome paint program with impressive flip-frame animation powers. **Best**

Features: Top-notch painting tools with 300-dpi capability and real-text layer; uncluttered animation interface; includes HyperCard playback utility. **Worst Feature:** Painted animation is inherently more difficult to edit than object-oriented animation. **List Price:** \$150. Published by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. Version 1.0 reviewed. Requires Mac Plus or SE with two 800K drives, System 6.0.2 or later. Not copy-protected.

This space
represents the
potential memory
available in
your Mac.

But this
is all you've
got.

Until now. But now there's a way to take full advantage of the Macintosh operating system's 8 megabyte capacity—without shelling out megabucks for expensive memory chips.

Introducing VIRTUAL—the virtual memory software for the Macintosh II, IIx, IIcx and SE/30. By putting information normally stored in RAM on your hard disk—and retrieving it transparently as required—VIRTUAL allows you to run multiple “memory hogs” concurrently under Multifinder. And at just \$295 (or \$695 for the Macintosh II), VIRTUAL not only helps with memory that's too full... it also helps keep your checkbook from getting too empty.

To order, call 415/324-0727.

MEGABYTES NOT MEGABUCKS **CONNECTIX**

Connectix Corp. 125 Constitution Dr. Menlo Park, CA 94025



Please circle 101 on reader service card.

If you don't see exactly what you're looking for, just ask.



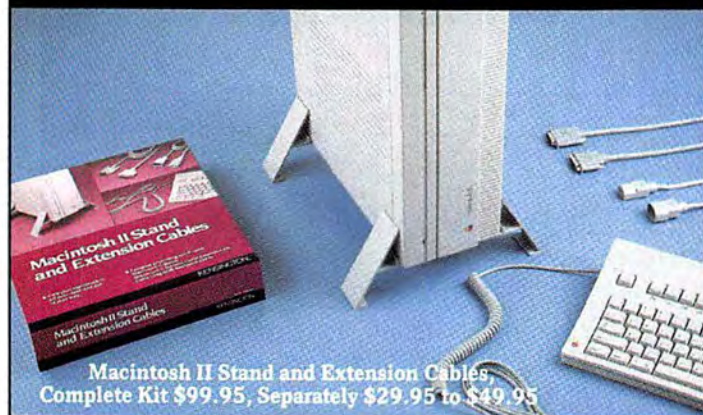
System Saver® Mac, \$99.95



Macaccessories® SuperBase™, \$49.95



Macaccessories Tilt/Swivel, \$29.95



Macintosh II Stand and Extension Cables, Complete Kit \$99.95, Separately \$29.95 to \$49.95



Master Piece® Mac II, \$159.95



Power Backer™ UPS's, \$399 to \$1,399, Network Interface, \$99.95



Turbo Mouse® ADB, Turbo Mouse Plus, \$169.95 each



Large Screen
Anti-Glare Filters
For AppleColor™,
Radius™, and Sigma
Designs™ Monitors,
\$99.95 to \$199.95

Macintosh II
Monitor Stand,
\$99.95



Macaccessories Anti-Glare Filter, \$49.95



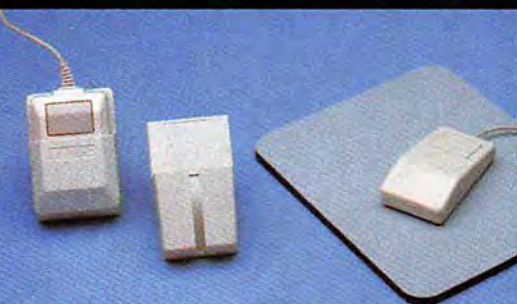
Apple® Security System, \$49.95



Keyboard Slideaway™, \$49.95



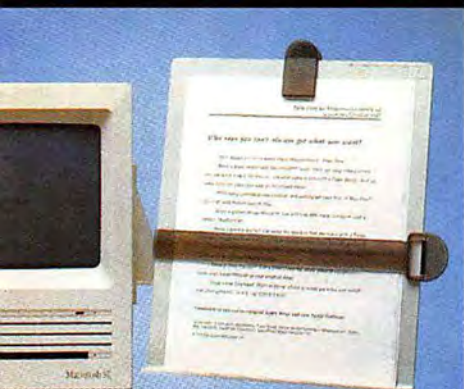
Universal Printer Stand, \$24.95



Mouseway, Mouse Pockets, \$9.95 ea.



Dust Covers, \$9.95 to \$24.95



Copy Stand, \$29.95



Macaccessories A-B Box, \$99.95

Chances are, we'll have it. Because, at Kensington, we're always finding ways to make your Macintosh® quicker and more convenient.

Our award-winning Turbo Mouse trackballs will make your Mac quicker with their automatic acceleration and advanced button features.

Our best-selling System Saver Mac will keep your Mac Plus cool, calm and collected with its quiet cooling fan, surge protection, and extra outlets.

And everything you see here will make your Mac more comfortable. Our Mac II Stand and Cables will get your Mac II off your desk and out of your way. And our Anti-Glare Filters are a sight for sore eyes — in every shape and size.

In fact, we've got so many good ideas, we couldn't fit them all in one ad. But we did manage to fit them in a free 20-page brochure, so call for yours today. Or ask about a dealer near you. 800-535-4242 or 212-475-5200. Or write to Kensington, 251 Park Ave. South, New York, NY 10010.

KENSINGTON 

See us at MacWorld
World Trade Center
Booth #5344

Please circle 144 on reader service card.



Desktop Publishing

Pin Mark

Face

Body or
Shank

Nick

Hair-line

Stem

Counter

Serifs

Beard or
Neck

Shoulder

Groove
Feet

noprstuvwxyz
34567890 1234567890



Fonts from A to Z

As the font wars heat up, you need a map to navigate the alphabet soup. Here's your Guide to Fonts, from hints to metrics.

My earliest encounter with typefaces came in the first grade. I had a choice of two: cursive and printing. Changing fonts was easy. For boldface I pressed hard on a black crayon, and for italics I used my

left hand. This newly discovered typographic control went largely unnoticed, thanks to teachers who thought my letters more cuneiform than uniform.

I finally turned those hen scratches into perfect type with the Macintosh, using sophisticated typographic tools once available only from expensive typesetting machines. The Macintosh's abilities are now famous, and type manufacturers who once saw the Macintosh as a typographical footnote are now falling all over themselves to make headlines. In the wake of these new type designs, Apple and Adobe Systems are in a feeding frenzy over font-technology standards, adding further confusion to the issue of which printers and libraries to buy.

By Steve McKinstry

Fonts from A to Z

As manufacturers of PostScript clones and font utilities fight over the leftovers, users blitzed with new buzzwords such as *hints*, *encryption*, *metrics*, and *font-ID conflicts* must also consider the quality of type design. Even if you like a typeface, it may not like your programs, your printer, or your pocketbook.

To keep you afloat, we've compiled a typographic primer, with some basic facts on how type works and who's making the type you want, as well as some fundamentals of good type design, while warning you of hidden hazards. We'll also throw you some lifesaving utilities for font management and manipulation.

The ABCs of Digitized Type

The advent of digital type has made type design more flexible, portable, and accurate than ever before. What's more, its movement to the personal computer gives you access to virtually any digitized face, delivered on one piece of affordable machinery.

Today, companies such as Adobe (Mountain View, California) and Bitstream (Cambridge, Massachusetts) use large workstations and proprietary software to digitize original typefaces or to convert already digitized outlines to PostScript (Adobe's page-description language) format. Some companies, like Adobe, use artificial-intelligence programs to add hinting — the process by which quality font rendering is produced at small point sizes on low-resolution printers (see Figure 1). Companies

with more limited resources use off-the-shelf font editors such as Fontographer from Altsys (Plano, Texas) to create original Mac typeface designs by using Bezier curves (mathematically optimized lines and arcs).

After the originals have been digitized, fonts on the Mac are developed in two basic formats: bit maps for the screen and ImageWriter output and PostScript fonts for laser printers. New font technologies, including Adobe's ATM (Adobe Type Manager) and Apple's outline format (see Fine Print in this issue's DTP section), will allow fonts for display and printing to be generated from the same PostScript description, but for now, it's a world divided. (Both schemes provide high-resolution type on-screen without the bit-map jaggies we have come to know and hate.)

As it is, the screen fonts you see are not what you want. They're mapped to a crude 72-dot-per-inch (dpi) matrix of square dots or pixels. Bit maps do not enlarge or reduce without distortion, so fonts loaded into the System file must be *optimized* for a particular point size to get the smoothest resolution on-screen. This means you must load screen fonts for every size into your System, since fonts look increasingly jagged the more they're scaled from an optimized size (see Figure 2).

PostScript typefaces, on the other hand, are independent of the screen and consist of a series of PostScript commands that mathematically de-

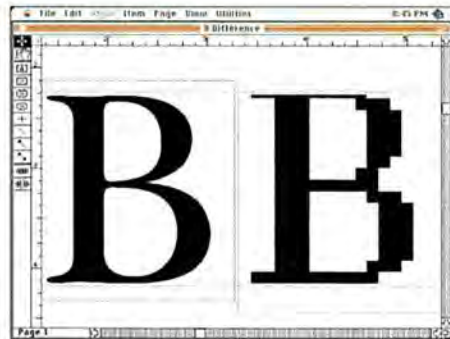


Figure 2: Screen fonts get more jagged as they're enlarged. To get 48-point type, for example, a 24-point optimized font adds two pixels for every one, doubling the size.

fine the line paths and arcs that make up each character's outline. A printer equipped with a PostScript interpreter uses a single outline description of a font to scale it up or down within a range of 2 to 127 points.

PostScript fonts are either resident in the printer's ROM or downloaded into its RAM, and they're substituted for the screen fonts for printing (for more on PostScript printing, see "Fit to Print" in this issue). The printer looks for the outline first in ROM, then in its RAM, next on a hard disk attached via a SCSI port to the printer, and finally in the System Folder. Apple's current System continues to download fonts as needed. If it can't find a PostScript description for a font, the printer substitutes a similar font — Times for Baskerville, for example — or constructs a bit-mapped equivalent that produces ragged results. Downloaded fonts stay in the printer's RAM until you switch the power off.

5 Point Baskerville	5 Point New Baskerville
7 Point Baskerville	7 Point New Baskerville
9 Point Baskerville	9 Point New Baskerville
12 Point Baskerville	12 Point New Baskerville
18 Point Baskerville	18 Point New Baskerville
24 Point Baskerville	24 Point New Baskerville

Figure 1: Several point sizes of Bitstream's Baskerville without hints are compared with Adobe's New Baskerville with hints. At small sizes, the unhinted type is heavier and loses fine details. This is less noticeable as the point sizes increase.

Type separates into general categories of display and book fonts. Display fonts are used for larger text such as titles or headlines and usually require no hinting. Book fonts are meant for smaller sizes such as long runs of book, magazine, or newspaper text. Without hinting, they can provide excellent results at 600 dpi or higher and proof-quality type from a printer at 300 dpi or less. With hinting, they can provide excellent results on 300-to-400-dpi machines, but some people believe that important design information is lost at higher resolutions.

On the Font Battlefield

The LaserWriter is built by Apple, but the PostScript interpreter and 35 standard fonts (11 faces) resident in the LaserWriter's ROM are licensed from Adobe. Most of the typefaces Adobe uses are, in turn, licensed from Linotype or ITC via digitized originals created by URW (West Germany). Adobe converts these outlines to PostScript format, adding hints and encryption that encode the fonts in a format only the PostScript interpreter can translate. Until now, this situation treated any downloadable font not playing by Adobe's rules as a second-class citizen. A printer or font manufacturer wanting to print with Adobe's encrypted-font technology (classified as Type 1 fonts) needed to license Adobe's PostScript interpreter or font technology, which made printers more costly and type slower to process.

Relief was forthcoming. This year, Bitstream and RIPS broke Adobe's font-encryption code. Bitstream now supplies most of its high-end library in Type 1-compatible encrypted fonts for use on high-resolution typesetters equipped with Adobe's PostScript interpreter. RIPS manufactures PostScript-clone interpreters for use in PostScript-compatible printers. At the

same time, font manufacturers such as Bitstream and URW are digitizing huge libraries of type with hinting schemes of their own. Apple jumped in with its QuickDraw (non-PostScript) font technology for producing high-quality screen and printer fonts, complete with hints (called instruction sets), and made it available to any third-party developer.

Adobe responded to this pressure by licensing its font encryption and hints to other type manufacturers such as AGFA Compugraphic (Wilmington, Massachusetts), Monotype (Chicago), and Varityper (East Hanover, New Jersey) and its interpreter or

controller to printer manufacturers such as Canon and Autologic. If the libraries from these typemakers are converted to the Adobe format, they will form the largest electronic-type library in the world at about 6,000 fonts. Of the 3,000 faces now available in the Linotype library, about 487 are available for the Macintosh from Adobe, including original designs such as the Stone family.

The Typemakers

More than 25 font companies are currently marketing PostScript downloadable fonts. Bitstream, formed in 1981 by former Linotype employees,

Font Toolbox

FontDisplay by Jeff Schulman prints information about the fonts installed on your Mac. It can print a font's entire ASCII character set, including its keystroke combination, its location on-disk, its ID number, the sizes installed, and the characters per pica for a selected size. It's especially useful for spotting ID conflicts. This shareware program is available on most bulletin-board services.

FontLiner from Taylored Graphics (Freedom, CA) saves time in retracing scanned fonts. The utility converts any font created with Fontographer into Illustrator format. Control points and Bezier curves of the font can then be manipulated with the tools available in Illustrator or FreeHand.

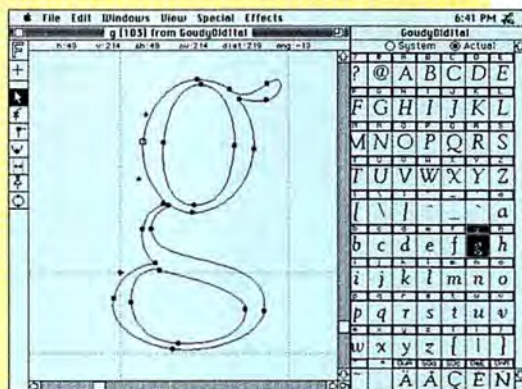
FontSizer from U.S. MicroLabs (Austin, TX) renders optimized bit-mapped screen fonts for any PostScript font in your system. You choose fonts from a list, with the point sizes you can build, and load them into your system with Font/DA Mover. Altsys' (Plano, TX) **FontTastic Plus** lets you customize or create bit-mapped fonts; version 2.01 lets you edit larger fonts and supports the New Font Number Table (NFNT). Altsys' **Fontographer** is an excellent laser-font creator, supporting 300-dpi PostScript files.

Kerningware Marketing's (Toronto, Canada) library of kerned tables for Adobe fonts includes software that allows users to change kern values in the Adobe tables, as well as in those of other manufacturers.

Suitcase II from Fifth Generation (Baton Rouge, LA) and **Font/DA Juggler Plus** and **Master Juggler** from Alsoft (Spring, TX) can handle the proliferation of DAs and fonts as well as spot font-ID conflicts.

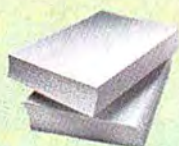
Varityper's **FontMaster** and its companion, **FontWizard**, are available on most bulletin-board services. As a DA, FontMaster provides a fast look at sizes, font IDs, or NFNT IDs of the fonts installed in your system. FontWizard can display a font's entire character set.

CopyFit is a public-domain program by John Lutz and is available on most bulletin-board services. It provides instant calculations based on the column size, font, point size, and number of characters in the LCA (lowercase alphabet) at 6 points.



Font editors such as Fontographer let you become an independent type designer. This design of Goudy Old Style was designed for Altsys by Judith Sutcliffe, who now runs her own company, The Electric Typographer. Fontographer supplies fonts in Fontographer format that can be opened and manipulated, a good way to study how a designer creates a font with Bezier control points.

The BigBin 1000. Because 200 sheets is not enough.



BigBin™
1000-sheet
capacity for
Apple® LaserWriter®
IIIS, LaserWriter
IINT, and Laser-
Writer IINTX

The BigBin is a motorized paper tray that replaces your LaserWriter II's old 200-sheet paper tray to give you 1,000 sheets of paper. That means you can print bigger jobs unattended. Satisfy the paper-hungry needs of a Macintosh® network. And spend less time refilling paper.

Sizable advantages BigBin lets you load 1,000 sheets of letter-size paper. All at once. You can even add a kit that handles legal-size.

Simple addition BigBin is a simple addition to your computer system. Just replace your printer's paper tray with BigBin and plug it into the wall. It's fully approved by Apple Computer for use with Apple LaserWriter IIIS, LaserWriter IINT, and LaserWriter IINTX. And BigBin is covered by a limited 90-day warranty.

Despite the big name, BigBin needs only about a foot of space in front of your printer, and it weighs in at only 14 pounds.

To make the connection BigBin is available exclusively through authorized Laser Connection™ dealers. For more information on how BigBin can maximize your paper handling, call Laser Connection at **1-800-523-2696** for the dealer nearest you.

And be sure to ask for a free copy of *The Sourcebook*™—our exclusive catalog filled with the latest laser printer products and enhancements.

**LASER
CONNECTION™**
A QMS® Company



The following are trademarks of their respective companies: BigBin, The Sourcebook, Laser Connection of QMS, Inc.; Apple, LaserWriter, Macintosh of Apple Computer, Inc.

Please circle 181 on reader service card.

© 1989 QMS, Inc.

Fonts from A to Z

offers stiff competition to Adobe. With the Bitstream Type Library, MacFontware, and SoftFonts for the Macintosh, and with comparable fonts in the PC market, Bitstream is taking the high road to type quality by remaining true to original typefaces. The majority of its nearly 1,000 faces are available as encrypted, unhinted fonts (classified as Type A) for printing on high-resolution printing devices that use Adobe's PostScript interpreter (such as the Linotronic) or as unencrypted, unhinted fonts (Type C) for low-resolution PostScript printers. Plans call for hinted fonts (Type B) for printers equipped with Bitstream's FontWare Typescaling Technology.

MacFontware is a 40-face, 16-family library of unencrypted, unhinted fonts that print on LaserWriters and PostScript-compatible clones. Designed to be *device-independent*, MacFontware installs like Adobe's fonts and delivers proof-quality type at small point sizes on low-resolution machines. SoftFonts, a 35-face, 11-family library, are bit-mapped screen and printer fonts designed to print well on QuickDraw printers such as the LaserWriter SC and the ImageWriter. Bitstream supplies PostScript versions of these faces, which match Adobe's metrics and are used as the

resident faces on clone printers.

AGFA Compugraphic has released its library of CG fonts in the Studio Series. Created in Fontographer format, they were chosen to complement rather than duplicate what is already available elsewhere. Its Professional Series will offer fonts under the company's license with Adobe.

URW's 2,000-typeface library is being marketed by The Font Company (Phoenix, Arizona). As the official digitizing agent for ITC, it digitized many of the original typefaces licensed by companies such as Adobe. It differs from Adobe by producing unhinted type, maintaining that hinting requires "generalized" font designs with reduced control-point information (see Figure 3). It's aiming instead for the high-resolution (greater than 600 dpi) typesetters. Because of the extra font information, URW's fonts require more disk space and printer memory. Also, URW faces include many special characters (ligatures) and kerning pairs. More than 200 faces are currently available in its Typographic Series. The Display Series is available as PostScript fonts and as files that can be opened in Illustrator 88 or FreeHand.

Kingsley/ATF (Tucson, Arizona) is one of America's largest type found-

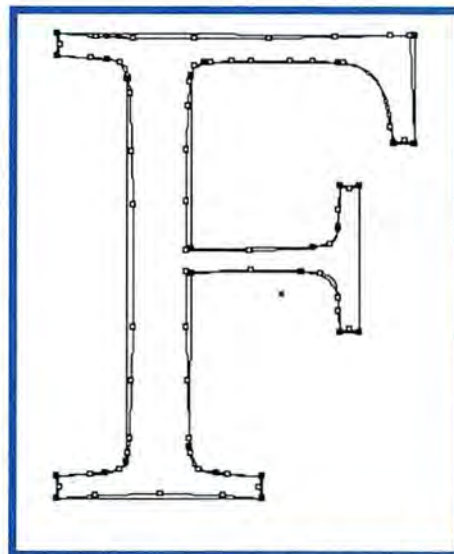


Figure 3: If type is generalized for rendering at low resolution, it can compromise a design. The illustration shows clear boxes on a font outline with all the font information intact. There are fewer black boxes on the second outline, which creates simpler curves. This alternative provides good data compaction, but the font has lost some of its subtle design attributes.

dries with 20,000 typefaces. Its first product, ATF ProType, will be sold in packages of up to six fonts. Some packages will offer ATF's hinting technology to compete with Adobe's, but the library will be largely display faces. Each package will have utilities to generate screen fonts and modify kerning. Another product, ATF Type Foundry, is similar to the

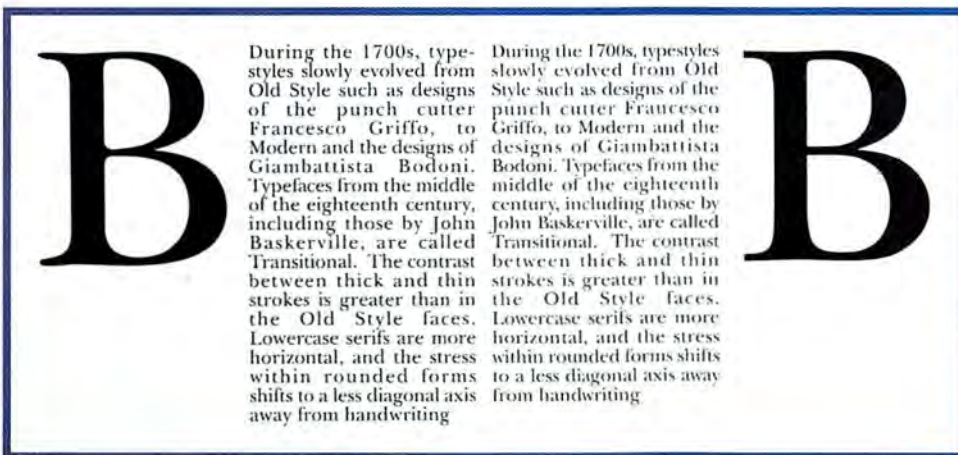


Figure 4: Different font metrics can make the same face from two manufacturers have different line endings and page breaks. This figure shows two 12-pica columns: Baskerville from Bitstream on the left and New Baskerville from Adobe on the right.

America's source for MacProducts

1 MB SIMM's



1MB SIMM's\$129
Available now. Lifetime
Manufacturer's Warranty!
256K SIMM's\$59

PRINTERS

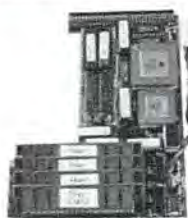
Qume ScriptTEN.....\$3195
Qume CrystalPrint\$3195
Seikosha.....\$235
GCC Printerscall

MAGIC NET



100% Flash Box, Phone Net,
Local Talk compatible
SALE.....\$19.95
STAR Controller\$149.00

020/030 RailGUN



16 mhz 68020\$499
25 mhz 68020\$895
Faster than Radius, Dove,
Irwin. Comes with Smart
Cache.
25 mhz 68030\$1395

MAGIC DRIVES

	Internal	External
20 megabyte	\$389	\$579
30 megabyte	\$399	\$599
45 megabyte	\$519	\$649
60 megabyte	\$599	\$699
80 megabyte	\$699	\$799
91 megabyte	\$850	\$950
150 mb CDC	\$1395	\$1495
300 mb CDC	\$1995	\$2350
600 mb CDC	\$3550	\$3650

SMART CACHE

- SCSI Disk Cache
- Cuts 30-50% off the access time of any SCSI hard drive
- Tracks your history and optimizes using 64 caching algorithms
- Write through cache for maximum data integrity

\$99

VIDEO PRODUCTS

13" & 14" 100% Apple Compatible
8 bit color card\$449
19" 8 bit color card\$949
32 bit color card\$2995
RasterOps - Sigma Designs
Cornerstone - Taxan
PCPC - Viking
Call for prices

REMOVABLE MEDIA

60 mb Tape Backup\$695
150 mb Tape Backup\$895
45 mb Removable\$995
600 mb Read/Write
Optical Drive\$3750
1.2 gig Tape Backup.....\$3995

MAGICVIEW 19



19" B&W Monitors.
2 Page Display
72 dpi, 78 hz. Includes 19"
monitor and card for + SE,
SE/30, II, IIX, IICX.....\$999

MAGIC MODEM



100% Hayes Compatible
Auto Dial/Auto Answer
2400/1200/300 Baud
2-Year Warranty\$109
Red Ryder 10.4\$54

SOFTWARE

Adobe Fonts	Save 33%
Aldus Freehand	299.00
Big Thesaurus	54.00
Canvas 2.0	175.00
FileMaker II	225.00
Fluent Laser Fonts	53.00
Fox Base +	205.00
Illustrator '88	325.00
LightSPEED C	169.00
MS Word 4	249.00
Mac Link +	139.00
MacDraw II	375.00
MacWrite II	189.00
Managing Your Money	129.00
Master Juggler	call
Master Tracks Pro	269.00
Mathematica	call
MiniCAD +	519.00
MS Works 2.0	199.00
MultiClip	35.00
PageMaker 3.1	379.00
Persuasion	355.00
Quark XPress 2.1	475.00
QuickKeys	65.00
Red Ryder 10.4	54.00
Retrospect	169.00
Suitcase II	48.00
SmartForm	305.00
SUMSAM	59.00
SuperCard	137.00
SuperPaint 2.0	129.00
Swivel 3D	289.00
TOPS Mac/IBM	165.00/call
Virex	68.00
WillMaker	32.00
WingZ	269.00
WriteNow 2.0	139.00

HARDWARE

45mb Removable Drive	999.00
45mb Cartridges, each	95.00
600meg Read/Write Optical Drive	3995.00
MacFax 9600	469.00
A+ Mouse	63.00
A+ Mouse (ADB)	85.00
Abaton Interfax	365.00
Cutting Edge 105 Keybd	115.00
Datadesk 101 Keyboard	142.00
800 K Drive/1.4 mb	175.00/Call
DaynaTalk	Call
Grappler Interfaces/Spoolers Call	
Kraft Quick SE, +	35.00
Lightning Scan	399.00
Thunder Scan 6.0	179.00
TOPS Flash Box	129.00
MIDI Interface	87.50
Seikosha Printer	234.00
Shiva Net/Modem v2400	459.00
ScanMan	379.00
TurboBridge	375.00
Turbomouse 3.0	119.00

MEDIA CONVERSION

Thousands of formats supported
3.5", 5.25", 8" and Mag Tape

MACINTOSHTM SYSTEMS

MacProducts USA carries all MacintoshTM systems and peripherals. We will configure a system to meet your needs. Call us today for current prices.

ACCESSORIES

Disks:	DS
Sony Boxed (10)	1.45
Sony Bulk (50)	1.15
MacDisk Bulk (50)	.99
KA0 Bulk (50)	1.35
High Density Disks	2.90
Black Ribbons	3.00
Colored Ribbons	3.50
Disk File/30/80	7.00/12.00
Fanny Mac QT	59.00
Hard Top Covers	Call
ImageWriter LQ Ribbons	15.00
ImageWriter LQ 4-Color	25.00
MacGuard - Surge -	25.00
Mac Plus, SE Bag	59.00/69.00
Mouse Cleaner 360	12.00
Teak Disk Box 50/100/150	16/25/33

BOARDS/UPGRADES

030 Railgun Cache	4995.00
Cyclone 68030	Call
Daystar 68030/68882	5250.00
Dove SCSI	134.00
Dove Upgrades	call
MacSprint	229.00
Magic SCSI	69.00
Orion 16 mhz	699.00
EtherNet	call
68881, 68882 Co-Processors	call
PMU - 68851	299.00
512K-1024 Upgrade	149.00
128K-512K Upgrade	149.00
128K-1024K Upgrade	295.00
800K Drive & ROMS	299.00

ORDERING

Orders ONLY: 1-800-622-3475
Information: 1-512-343-9441
International: 1-512-264-0353
FAX: 1-512-343-6141
International FAX: 1-512-264-0354
Tech Support: 1-512-343-6133

Hours: 7am - 10pm, M-F
10am - 6pm Sat-Sun CST
Tech Support Hours: 9am - 5pm,
M-F CST

Minimum Order: \$40.00

Payment:



Visa, MasterCard, American Express, Optima (No surcharge), Checks, C.O.D., and Company & Institution P.O.s. Net 15.

Tax: Texas residents only, add 7 1/2% sales tax.

Prices and items are subject to change and availability.

Terms: You are not charged until your order is shipped. Returns may be subject to a restocking fee.

Shipping: Minimum \$4.50 -- Airborne, UPS Next Day & 2nd Day Air, US Mail.

Leasing: Available on orders over \$2500. Call for more information.

MacProducts USA carries over 3500 products for the Mac, so call for products not listed. Call for a free catalog.

MacProducts USA

8303 Mopac Expressway • Suite 218 • Austin, Texas 78759 • USA • 1-800-622-3475

1-800-MAC-DISK

Enter the
latest word in
Macintosh
security.

EMPOWER

The ultimate test of any Macintosh security software is this: Is it as convenient to use while you're working as it is impossible to fool when you're not? If the answer is no, don't buy it. Part-time safeguards only protect a false sense of security.

Empower™ is the ultimate Macintosh security measure. It ensures full security with just a user password. Performs automatic, transparent encryption and decryption without delay. And provides multiple access levels by user, group, department or organization. It's the most convenient, most capable Mac security available.

Empower your Mac to secure your secrets. A word is all it takes. Call (408) 433-5467, ext. 300 to hear more.

Dealer inquiries welcome.

MAGNA



Empower is a trademark of Magna.
Macintosh is a registered trademark
of Apple Computer, Inc.
© 1989 Magna

Send me your *Guide to Macintosh Security* and
an Empower information kit.

2540 N. First St., Suite 302, San Jose, CA 95131
Fax (408) 943-0651, AppleLink: MAGNA

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone () _____ Ext. _____

300

Please circle 54 on reader service card.

ANIMATION IN LESS THAN 1 MINUTE WITH STUDIO/1™



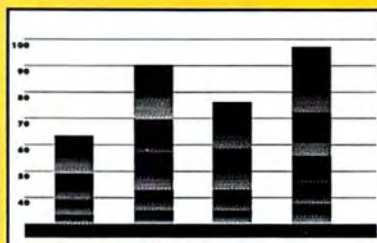
MOTION PICTURES IN 24 SECONDS

Automatic page flipping makes fluid animation as easy as moving the mouse.



CAPTIVATING TITLES IN 42 SECONDS

Set a start and end point, and Studio/1 does the rest.



DYNAMIC PRESENTATIONS IN 56 SECONDS

Studio/1 includes special animation effects for automatic transitions, fades and distortions.

1/2 PRICE LIMITED OFFER:

Get Studio/1 for only \$75 (plus shipping and handling) when you trade up from any Macintosh paint or animation product. Offer good until Nov. 30, 1989. Demo disks also available for \$10. Both offers good through Electronic Arts Direct Sales only. Call 800-245-4525 for details (M-F, 8-5 Pacific time).



All this, and a full-powered paint program too. 300 dpi editing, a PostScript® quality text layer, direct Apple Scanner® support, 3D perspective, editable Bezier curves, powerful selection tools and editing at 8 magnification levels, including zoomed-out mode. HyperCard® driver and animated slide show player included with Studio/1.



ELECTRONIC ARTS®

Studio/1 is a trademark of Electronic Arts. HyperCard, Macintosh, and Apple Scanner are registered trademarks of Apple Computer Inc. PostScript is a registered trademark of Adobe Systems, Inc. Requirements: Macintosh® Plus, SE, SE/30, II, IIx, IIcx; 2 disk drives or 1 disk drive plus a hard drive; System software 6.0.2 or later. Times represent animation renderings on a Macintosh SE. Other times may vary.

Please circle 128 on reader service card.

Fonts from A to Z

Font Toolbox Revisited

Aldus' **FreeHand** and Adobe's **Illustrator 88** each have typographic-manipulation tools for custom effects on typefaces already in the System file or on type examples scanned and traced with Bezier curves. Font outline (stroke) and interior (fill) can be set to individual weights, shades, and colors. Colors can be separated into CMYK, graduated, or created in tiled patterns. Typographic effects such as leading, letter spacing, and the ability to rotate, skew, flip, and scale are offered by both programs. FreeHand also gives you text bound to a path, horizontal spacing, and special zoom effects and lets you mix text in different fonts, sizes, styles, and colors in the same text block. Adobe's Collector's Edition I comes with a generic serif and sans serif face with editable lines and arcs. Aldus is located in Seattle, and Adobe Systems is in Mountain View, CA.

QuarkXPress 2.1 from Quark (Denver) includes a feature for accessing the kerned pairs on PostScript fonts. Changes in kerned pairs can be exported from or imported to other fonts in the same family. Unfortunately, the information is stored in the data file and is not available to other systems or a service bureau, unless they use your copy of the program and data file.

MacKern from ICOM Simulations (Wheeling, IL) lets you adjust the font metrics for kerned pairs and optionally update them to new settings. The program can check resource-ID numbers and allows the user to reassign numbers if there is a conflict.

SmartArt from Emerald City Software (Menlo Park, CA) is a DA that creates special effects such as shadows, fades, and angled text from any PostScript font in your system. You can select the text's size, rotation, kerning, angle, and percentage of gray. Results are saved in EPSF for pasting into other programs.

LetraStudio from Letraset (Paramus, NJ) manipulates the fonts of the LetraFont Library. These fonts are not installable or downloadable but exist as graphics files. Effects include the ability to color, reshape, skew, distort, create a drop shadow, overlap letters, rotate, scale, and change fill and stroke weights. Eighteen basic shapes can be applied with movable handles to bend, stretch, shrink, curve, or slant text. The program has basic drawing tools and can track, kern, size, print, save, and paste into other page-layout applications in PICT or EPSF formats.

LaserFX from Postcraft International (Valencia, CA) was one of the earliest programs available to provide up to 30 special PostScript effects on system fonts. Drop shadows, gradations, skewed and angled outlines, and decorative fills are among the features. Type can be saved and pasted into other programs.

Broderbund's (San Rafael, CA) **TypeStyler** can apply an array of special effects to type created in Fontographer. Type can be saved in PostScript outlines, complete with editable anchor points. These outlines can be exported to graphics programs for additional manipulation. Results can be printed directly or saved in several standard graphic formats.

LetrTuck from EDCO (Tampa, FL) lets you choose a font to edit, select a kerning pair from a table, and adjust its spacing. This information becomes permanently attached to the font for any application you use. Files can be reedited at any time.

program ATF uses in-house to digitize fonts and will let users create outlines for their own fonts.

Casady & Greene's **Fluent Laser Fonts** were some of the first downloadable fonts in Fontographer format. Now, Image Club (Calgary, Alberta, Canada) plans a 600-typeface library of PostScript fonts on CD-ROM discs. Fonts will also be

available in editable outlines that can be manipulated in programs such as Illustrator 88. Altsys, creator of Fontographer and an early supplier of PostScript fonts, is not currently adding to its library but may have its fonts distributed by a third party in the future.

Other companies marketing type designs worth looking into include

Alphabets, T/Maker, Electric Typographer, MacTography, Olduvai, Treacy Faces, Springboard Software, Studio 231, EmDash, and Dublin-Click Software.

Type and Meter

On one level, selecting from this embarrassment of riches is one of preference. Either you like the way type looks or you don't. But good type design is also based on traditional principles of shape, spacing, weight, and rhythm as guided by the eye of a good type designer.

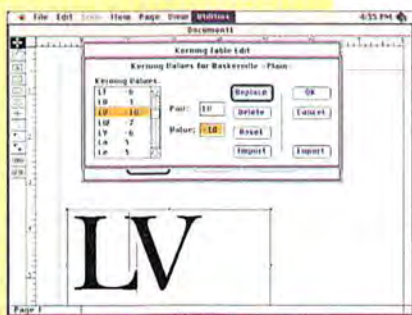
Metrics establish the basic height and width of the area surrounding a letter, dictating the spacing, or "set width," between characters.

If the basic metrics of a font's set width aren't to your liking, you can change them in certain programs with kerning controls that adjust the spacing between letters and words. Most page-layout programs have a tracking feature that allows custom kerning, but kerning can also be set in

the typeface through the use of kerned pairs that optimize the spacing between certain problem characters (a capital A next to a capital V, for example). A well-designed typeface can have 120 to 500 kerned pairs.

The basic building block for a typeface is the em square: The letter M has the largest width and height dimensions of any character of the alphabet. Letters are designed on an em square broken into units to establish vertical measurements of baseline, meanline, x-height, ascender, descender, and cap height. Horizontal measurements, called side bearings, maintain the width of a character.

Differences in measurements are nothing new, but now that type manufacturers are producing type with their own metrics on their own machines,



Access to font tables is available through font-management utilities, some page-layout programs, or the font-metric files shipped with typefaces. Shown here is the kerned value for LV edited in Quark XPress 2.1.

Fonts from A to Z

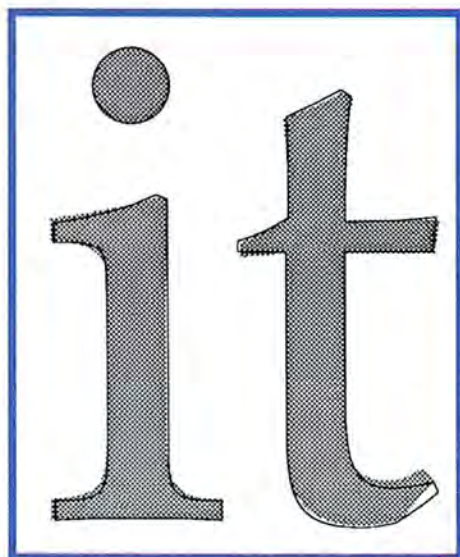


Figure 5: Compared are Bitstream's Zapf Calligraphic (outline) and Adobe's Palatino (gray). Notice how Bitstream has generalized the stem in the *i* while Adobe has done it in the arms of the *t*. The overlay was done in Adobe's Illustrator 88 and is a good way to compare outlines of type from different manufacturers.

discrepancies are more evident from font to font and system to system. For example, if you create a document in Bitstream's Baskerville and open it in a system that has only Adobe's Baskerville, the first problem will be a font-ID conflict, because the font-ID number of Adobe's font is already taken by Bitstream (for more on font-ID conflicts, see "Fonts by Number," July '89). Selecting the text and switching the two will correct the ID problem, but the line endings and page breaks might not be the same as before (see Figure 4).

The problem is compounded when measuring systems and font attributes such as stem weights (the vertical strokes of a letter) are not kept to traditional standards. Normally a designer makes small variations in the stem weight from character to character for a more pleasing look. Some type designers, however, use the same stem weight for all vertical strokes, compromising the design

quality and changing the overall set width of a line when compared against the same face from another manufacturer (see Figure 5).

Adobe, for example, is standardized to 72 points to an inch, the same as the pixel resolution of the screen. Bitstream, on the other hand, maintains 72.289 points to an inch, in keeping with the original standards of the American Point System. At large point sizes, this discrepancy can show up, especially if you're trying to maintain the same typographic values when switching your publication from traditional typesetting to the Macintosh or when you're mixing and matching typefaces on different systems.

Bitstream uses the same metrics in MacFontware that it does on the PC, so line endings are the same from the two systems. Before buying, check display and book samples for basic character spacing and line-count matches. Bitstream supplies 35 resident faces from 11 families for the Qume CrystalPrint Publisher, for example. These fonts are Set Width Adjusted (SWA) to exactly match Adobe's resident fonts in the LaserWriter.

True to Form

The quality of a typeface can also be judged by its adherence to its original forms. Often, the roots of an original typeface are blurred by copies made at different times by different font developers. In contrast, when Bitstream wanted to include a Palatino face in its library (Palatino is licensed by Adobe), Bitstream brought in Hermann Zapf, the original designer, to supervise the design of a new Palatino-like face. The result was Zapf Calligraphic.

In turn, Adobe has intro-

duced a new line called Adobe Originals, which includes Utopia and a new version of Garamond that was extensively researched from recasts of original Garamond matrices in the collection of the Plantin-Moretus museum in Antwerp, Belgium. The Original Series has a special 144-character Expert Set that features extended sets of ligatures, titling caps, old-fashioned numerals, flourished caps, and more.

Nostalgia aside, many designs have been improved by new technologies and better printing methods. Bitstream Charter, for example, straightened serifs to avoid curves, which print poorly on low-resolution machines. In exchange, a unique typeface was born that was economical in construction and design (see Figure 6).

Consistency of stem weights, hairlines, and serifs from character to character (or between italic, bold, and bold italic) also indicates precision in designing a face. On the other hand, some letters such as the *O* and *A*, should vary from the other letters, extending beyond the cap height because of an optical illusion that makes them look shorter if they don't. To evaluate type, you must also consider its use and mix with other type. With thousands of fonts to choose from, don't overdo it. Pick a few faces that provide unique tex-

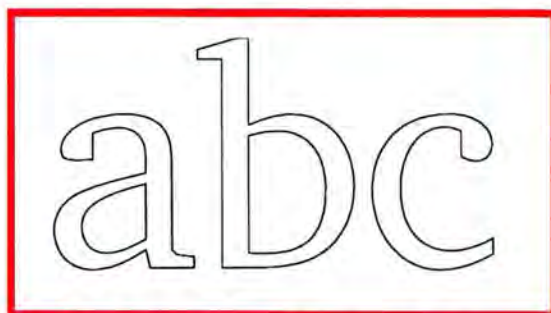
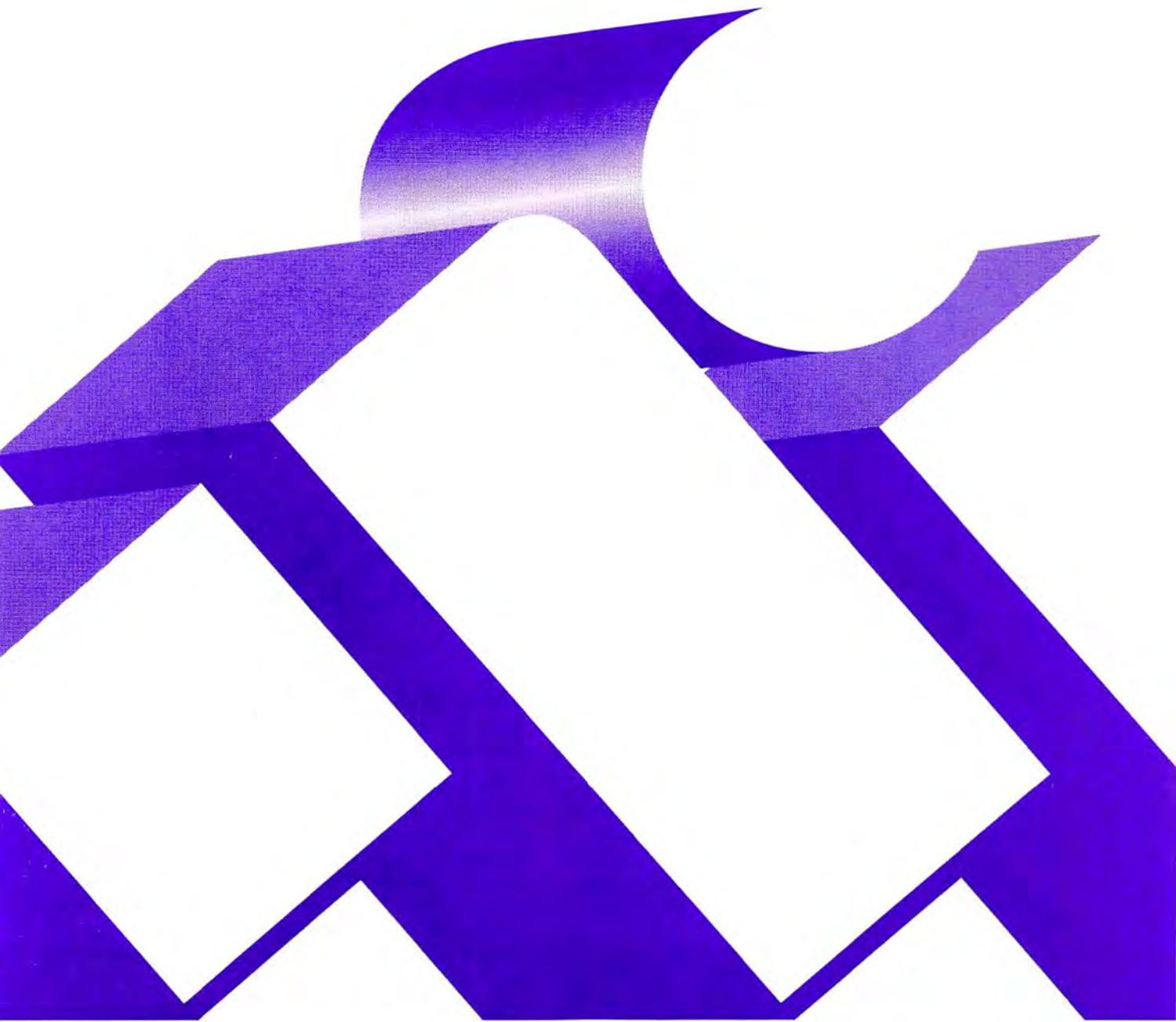


Figure 6: This figure is a sample of Bitstream's Charter, showing serif forms that combine a unique design and compact outline information for low-resolution printing.



The evolution of an industry leader.

 **MICROTECH**
INTERNATIONAL, INC.

 **MICROTECH**



MICROTECH
INTERNATIONAL, INC.

158 Commerce St., East Haven, CT USA 06512

Please circle 133 on reader service card.

Takin' care of business.

At Microtech, we make it *our* business to take care of *your* business. Our commitment is to offer you not only quality products, but real business solutions. Solutions you can count on. Because the more you demand, the more we deliver.

Only top-of-the-line components are used in manufacturing Microtech products to insure product solutions worth raving about. Like our NOVA 80, which Macworld rated "the cream of the crop...the fastest and least expensive external drive...". With unprecedented reliability, NOVA hard drives can work for any business solution.

For security and unlimited storage capacity, the high performance Microtech R45 removable cartridge drive is the perfect solution. Our Tape Backup Systems provide lightning fast, reliable solutions for archiving.

And only Microtech drives come with the longest warranties in the industry at no extra cost. Like five years on our external and internal hard drives and two years on our removable and tape backups. No one else offers that kind of confidence. No one! In addition, you'll get hundreds of dollars worth of free software,

including MacTREE PLUS, DS Backup, and a number of useful public domain programs. And now all of our hard drives come with demos of 4TH DIMENSION and SHOWCASE F/X.

We understand that along with great products, great service must follow. Before and after the sale, our dedicated customer service representatives are on hand to provide you with knowledgeable and friendly support. Toll free! And for 24-hour service, our *MicroLink™ BBS* provides technical support and software updates. Taking customer service a step further, Microtech offers the exclusive *Step-Up™ Expansion Program*, an easy, affordable upgrade path designed to help you keep pace with today's technology.

Quality products. Fantastic prices. Unequaled warranties. Dedicated customer service. These are the solutions you demand, and Microtech delivers. Takin' care of *your* business is *our* business, too. Call Microtech today.

1-800-325-1895



■ Nova Hard Drives

External		Internal	
N20	- 20MB \$ 520	N40i	- 40MB \$ 569
N40	- 40MB \$ 649	N80i	- 80MB \$ 919
N80	- 80MB \$ 1019	N100i	- 100MB \$ 999
N100	- 100MB \$ 1099	N150i	- 150MB \$ 1399
N150	- 150MB \$ 1469	N320i	- 320MB \$ 2699
		N650i	- 650MB \$ 3430



■ Tape Backup Systems

NT60	- 60MB \$ 799
NT150	- 150MB \$ 1099

■ Removable Hard Drives

R45	- 45MB \$ 1099
-----	-------------------

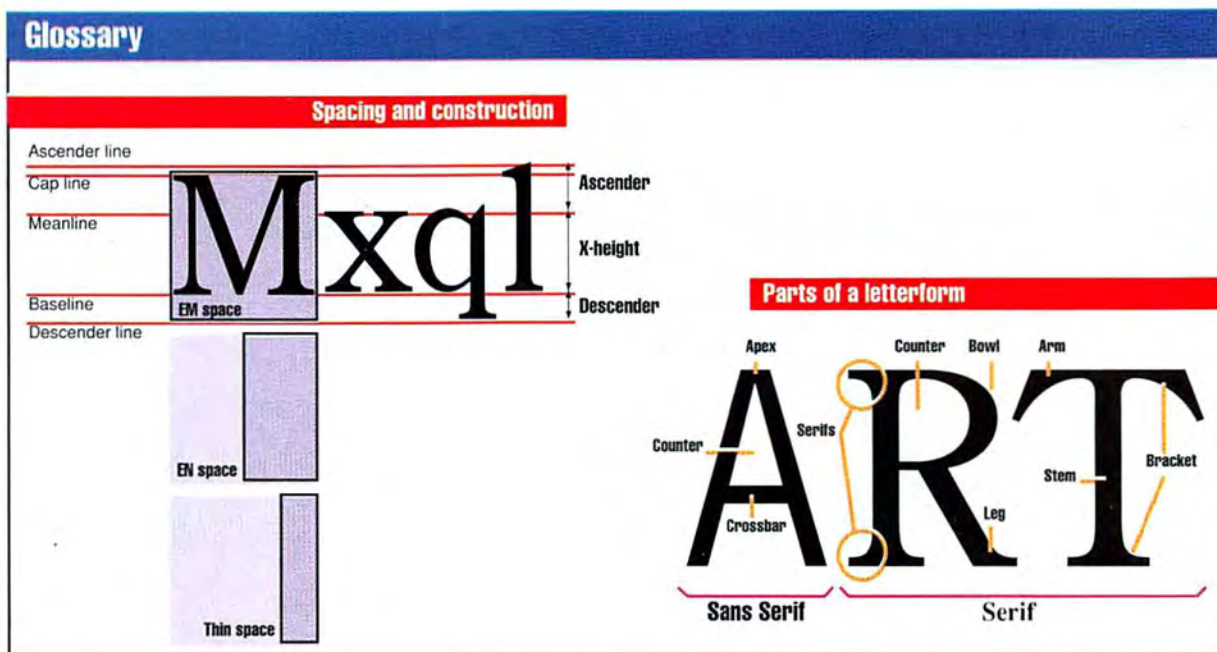


MICROTECH
INTERNATIONAL, INC.
158 Commerce St, East Haven, CT USA 06512

© 1989 Microtech International, Inc. All product names and logos are trademarks or registered trademarks of their respective owners. The 5 year limited warranty is offered on hard disk drives sold and delivered in the U.S. or Canada. Certain restrictions and exclusions apply. Terms and conditions of the 5 year warranty are available upon request. Prices and specifications subject to change without notice. MasterCard and Visa accepted at no extra charge.

Please circle 134 on reader service card.

Fonts from A to Z



In this illustrated glossary, some typical typesetting terms are defined by example. (Note: Thin space defines half an en space and refers to a fixed amount of space between words or characters, although it's shown here as a ratio.)

the drive
for the rest
of us

tural contrasts of heavy and soft, light and dark, serif and sans serif, and you'll have the beginning of a well-designed page.

Future Fonts

Time will tell if PostScript clones, type libraries, and Apple's new outline-font technology erode Adobe as a de facto Macintosh type standard. Adobe plans to support Apple's technology with utility-conversion software, but don't expect typeface support for third-party QuickDraw printers or PostScript clones. To compete, clones may need hinted typefaces of their own and their own conversion utilities to support Apple's new font technology.

Service bureaus will also be under pressure to support the typefaces and printers customers eventually choose.

Supporting and fixing incompatibilities from font-ID conflicts and different metrics may result in higher charges from your bureau and more work and expense for you. Adobe's ATM may reduce your reliance on screen fonts, but before you drag them into the trash, consider the expense involved. Many designers use screen fonts lent from their service bureau. Switching to ATM will require the printer font as well.

Users concerned about typefaces and printers may see Adobe's fonts as their safest choice, at least for now. They are proven performers on thousands of installed printers and well supported at the service-bureau level. In addition to Adobe's own type design releases, more are on the way from licensees, but not necessarily with the same metrics. For

those who want their typefaces to look good on printers of varying resolutions, Adobe's hints are the envy of the industry, and ATM will work on any Adobe font you own.

Even so, limiting yourself to one type manufacturer may deny you some unique typefaces, and you won't be able to take advantage of the savings offered by competitive fonts and printers. It's possible to mix and match, but only by shopping around, asking the right questions, and defining your output needs will you and your Mac be able to put on — to use a bad pun — a happy face. ☺

Steve McKinstry works with DPI in San Francisco, specializing in design consultation and the conversion of publishing companies to DTP. His clients include U.S. News & World Report, PCW Communications, and The Chicago Tribune.

What happened to Simple?

What the rest of us really want is simple, that's why we own Macintosh® *Simple* in a floppy drive is a unified 3.5" floppy disk solution that can read files, write files, whether IBM® or Apple®—and back-up large files quickly, safely and conveniently.

No fuss, no muss.

Revolution 2.4

Drive 2.4: A revolutionary breakthrough in floppy disk technology for the Macintosh. Drive 2.4 is the only floppy disk drive that can *read, write and format* all current IBM and Apple 3.5" diskettes, create and use 2.4 Mbyte standard volumes, and provide *an average 4 Mbytes of back-up data storage* on a single diskette—faster than anybody else!

One drive does it all.

That's simple—for the rest of us.

Kennect™ Apple's SE/30 & IIcx

For the first time Macintosh SE/30 and IIcx owners can directly connect Drive 2.4, and unleash the full speed and power of Apple's new SWIM™ chip disk controller. Drive 2.4 provides unequalled flexibility for MS-DOS® file integration, dramatic increase in floppy disk capacity and the fastest, most powerful back-up solution available.

Rapport™—New life for an old Mac

Mac 512e, Plus and SE owners can have SWIM power and Drive 2.4 by using Rapport—the microprocessor based disk port module that upgrades the older disk ports to Apple's newest standard. With just Rapport and your existing 800K Apple drive, you'll have the world's most cost effective solution for disk data file exchange with MS-DOS machines.

World-Class Back-up: FASTBACK II

Kennect Technology is now including *NEW FASTBACK II™* with every Drive 2.4. *FASTBACK II* is specifically created to take advantage of the latest Macintosh technology to be the hottest, most powerful back-up program available.

See your dealer or call us for information, toll free: 1-800-552-1232, or inside California: 408/370-2866.



KENNECT™
TECHNOLOGY

120-A Albright Way, Los Gatos, CA 95030 • 800/552-1232 • 408/370-2866 inside CA • FAX: 408/370-0484 • AppleLink: D2997

KENNECT and RAPPORT are trademarks of KENNECT TECHNOLOGY. Apple, Macintosh, SWIM are trademarks of Apple Computer, Inc. MS-DOS is a trademark of Microsoft Corp. IBM is a trademark of IBM Corp. FASTBACK II is a trademark of 5th Generation Systems, Inc.

Please circle 161 on reader service card.

The Expert Is In

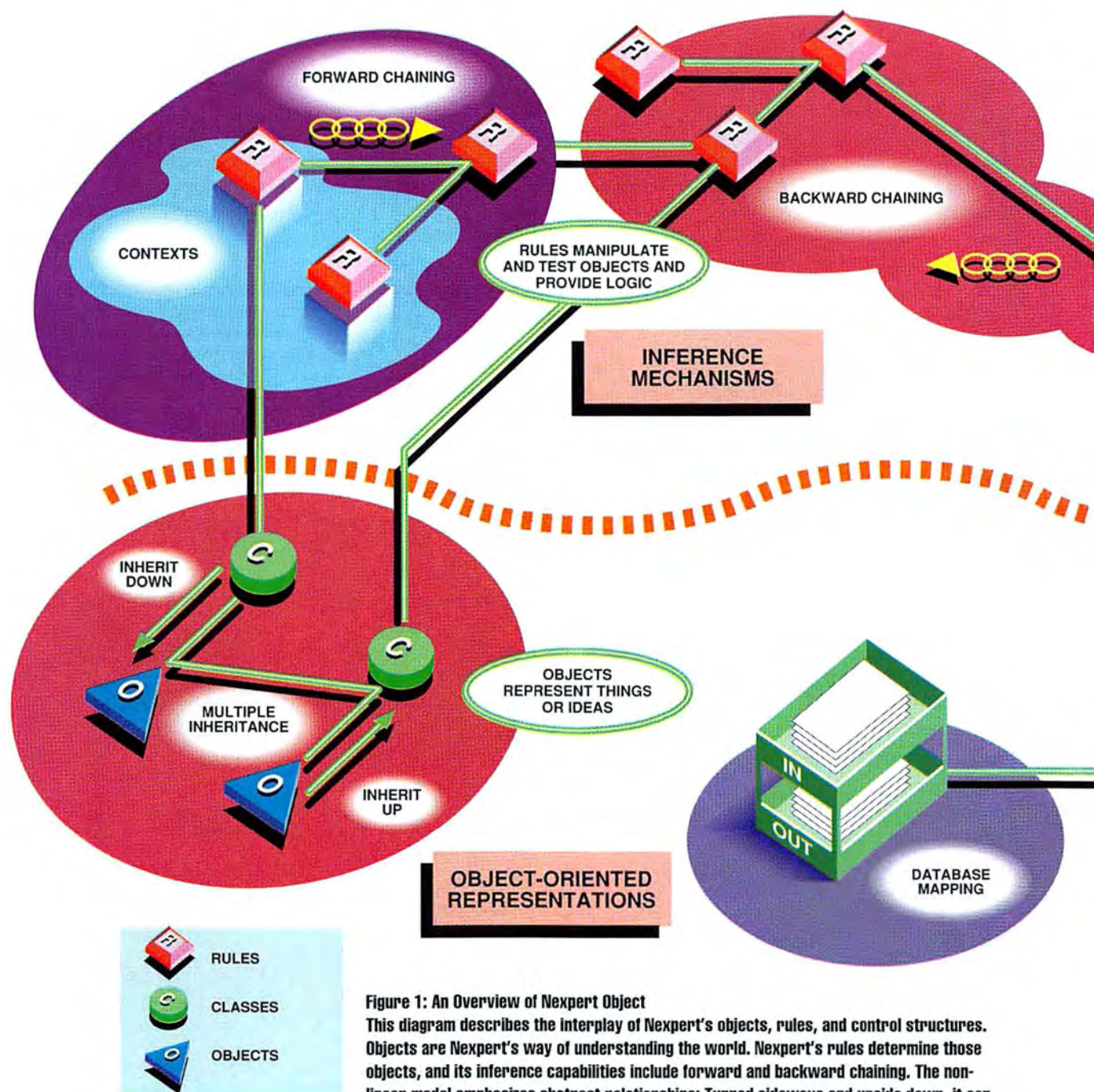


Figure 1: An Overview of Nexpert Object

This diagram describes the interplay of Nexpert's objects, rules, and control structures. Objects are Nexpert's way of understanding the world. Nexpert's rules determine those objects, and its inference capabilities include forward and backward chaining. The non-linear model emphasizes abstract relationships: Turned sideways and upside down, it can still make sense.

Expert systems take their place in the world of experts, with Nexpert Object leading the pack.

By Daniel Rasmus

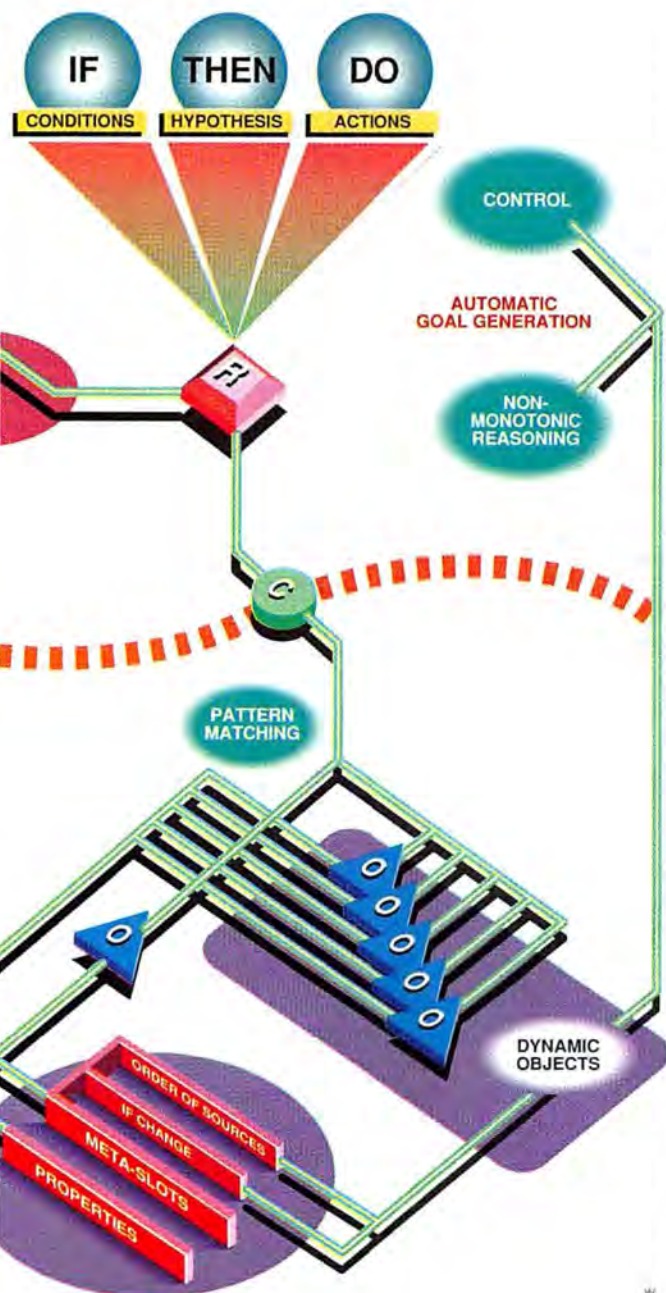


ILLUSTRATION: JIM LUDWIG

Expert systems are like idiots savants. Like Dustin Hoffman's character in the film *Rain Man*, they have exceptional ability in only one area, the task they're built for. But that's the secret of their success. In fact, expert systems are the most commercially viable part of the multifaceted field of artificial intelligence (AI).

Expert systems first proved their practical power at Stanford University in the early '70s with MYCIN, a program that provided advice on bacterial blood infections and meningitis to physicians who weren't experts in hematology and neurology. MYCIN was viable but not as a general-purpose savant. It could explain why it required information and how it drew a conclusion, but it could make a diagnosis only after precise input, and it was accurate only 65 percent of the time. (If that seems low, consider that MYCIN's human counterparts accurately prescribed treatment only 42.5 to 62.5 percent of the time. Idiots savants indeed.)

Expert systems are decision-making tools. They capture knowledge from human experts and make it available quickly and accurately. But expert systems don't provide black-and-white answers as tax-deduction programs do. Their answers are good rather than perfect. That's because expert systems manage expertise. When we speak of data repositories on computers, we call them databases. But data is only a small part of a business equation. A human being must look over the data to identify meaningful patterns — using a unique ability we identify as intelligence. AI researchers hope to capture that intelligence one day, but in the meantime, in the limited areas in which expert systems are applied, they have made tremendous progress. In many cases, expert systems perform more consistently and more quickly than their human counterparts.

Expert systems are currently in use in a wide range of business areas. BehaviorTech, for example, has developed an expert system called Exemplar to help reinforce learning in training situations. Federal Express moves your overnight deliveries through rapid and complex trails by means of inventory-control and customer-service expert systems. At Motorola, home of the microprocessor that powers your Mac, an expert system called Helpdesk walks customer-service representatives through service-request calls and then guides callers through hardware and software solutions for the computers it is programmed to offer advice on. In the financial arena, Peat Marwick Main & Co. has developed another expert system, Loan Probe, to evaluate loan applications.

If expert systems can serve in such important roles, then why do many management-information-system (MIS) directors continue to deride them? The first reason is political: In many cases, an expert system is a grass-roots effort that travels paths outside traditional MIS development procedures, threatening the MIS "priesthood." The second reason is technical: Expert-system technology is difficult to introduce when you're up to your neck in broken-down FORTRAN code and inundated with requests to enhance existing manufacturing, accounting, and engineering systems.

The technical issues should be easier to deal with than the political ones. Expert systems are not that complex if they are programmed well. When the MYCIN experiments were over, Stanford researchers realized they had done some fundamental research on a new class of programs. By stripping out the expert knowledge on blood from MYCIN, they retained the shell of the program. Today we continue to call expert-system programming packages shells.

A dozen expert-system shells are now available for the Macintosh. We provide some quick takes on them here. Newcomers to the field can take a detour now to get some basics on the structure of such shells by reading the "Anatomy of an Expert-System Shell" sidebar. Those who are already familiar with expert systems should stay in line to read about Nexpert Object, one of the hottest expert systems on the Mac.

The Expert Is In



At Koller Partners AG, Nexpert Object, a solid-modeling system, and the Oracle database are used to transform design ideas into production documents and machine data about factors such as machining time and machining costs. Koller, like many other manufacturing companies, faces the problem of keeping its design engineers in touch with manufacturing reality. Koller's system, CAP-ES (Computer Aided Planning-Expert System), interacts with design engineers to verify that designs are correct. The CATIA solid-modeling system is for building detailed views of machined parts. At any point during the designing process, Nexpert can be invoked to check the consistency of a design against engineering standards or to verify that a part can actually be manufactured. Design engineers can also call expert-system functions to obtain accurate estimates of machine time and costs for the incipient part.



Nexpert's knowledge-processing skills are also valuable inside factories. At Pirelli Tires, total quality control means a visual inspection of each tire. As details about defects are brought to the quality manager, he must make changes in the manufacturing process to prevent future defects. The quality manager often has to choose among several possible solutions to decide which is most the cost-effective and most important to implement. With Nexpert Object, two knowledge engineers, two experts, and about six months of intensive work, Pirelli developed the Total Quality Assistant, or TQA. TQA gathers defect data from the factory, defines repair actions, and computes the cost of various solutions. TQA is currently installed in one of Pirelli's Italian tire factories.



Nexpert is not limited to factory-floor and manufacturing problems. At Focus Technologies, biologists use 18 knowledge bases, the Oracle database, and four expert systems embedded in C applications to perform laboratory testing, risk analysis, and behavioral counseling for individuals with health risks. Focus is using Nexpert for its expert-system development, but reporting is handled through publishing software, graphical interfaces are written in C, and Oracle is accessed through an SQL precompiler. At Focus, Nexpert is an integral component of a collage approach to systems design that includes the best products in several categories.

Navigating with Nexpert Object

As the glow of Mac II screens cascades over cubicles that seem ripped from the side of a Sherman tank, Neuron Data engineers are honing one of the most innovative programs on the Macintosh. Nexpert Object, a \$5,000 hybrid expert-system shell,

IBM PCs; Apollo, Sun, and Hewlett-Packard workstations; VAX mini-computers; and IBM mainframes — another key reason for its market share.

Lower-priced and less-capable expert systems such as MacSmarts, Instant-Expert Plus, and Level5/

may seem esoteric and costly for the practical Macintosh, but this AI tool, with its sophisticated interface, is far from esoteric. With an estimated 40 percent of the high-end expert-system market, Nexpert Object competes with LISP-based tools such as IntelliCorp's KEE, Inference's ART, and Carnegie Group's Knowledge Craft. All of these systems are hybrids, mixing the traditional AI world of logical declarations with the expressiveness of intelligent object-oriented programming, but they require \$35,000-to-\$200,000 LISP machines, plus \$10,000 to \$50,000 in software. No wonder such systems have been branded esoteric.

Nexpert functions on a Mac Plus with 1 megabyte of RAM for the comparatively low startup cost of \$5,000. And with the exception of custom interfaces, Nexpert systems developed on the Macintosh are fully transportable to

Macintosh are excellent products for small stand-alone applications. Many of these shells can be linked to HyperCard or Excel, but they lack the richness of the Nexpert Object environment. Nexpert's ability to act as an embedded logic engine in computer-aided-design (CAD) software or gather information from mainframe databases puts it in a class above its entry-level cousins.

The Structure of Nexpert Object

Developing systems in Nexpert is a pleasure. Nexpert's hybrid design combines rules for inferencing and control with objects for representing things and ideas (see Figure 1). A highly graphical interface provides editors for rules, objects, classes, and other Nexpert elements. Nexpert's editing environment makes extensive use of pop-up menus to help simplify entry and save keystrokes associated with commands. Systems such as OPS5 and Level5/Macintosh, on the other hand, restrict developers to text editors during development. OPS5 works in the LISP environment, so its rules become available after entry, but syntax checking is nonexistent. Level5/Macintosh uses a compile-and-run method that checks syntax when it is compiled, so its rules are not available until a successful compile is completed. With Nexpert, rule syntax is checked rule by rule after the OK button is clicked. Once the rule is entered in the editor, it becomes an active member of the current knowledge base. Objects, classes, and other elements are also incrementally compiled.

With OPS5, graphic representations of rules are impossible unless you write your own LISP code or travel to expensive OPS5 environments such as ART or Knowledge Craft. And Level5/Macintosh provides only a simple and difficult-to-read rule tree. With Nexpert, network

windows visually describe the relationships between rules and objects in a knowledge base (see Figures 2 and 3). These networks are not snapshots in time but living documents updated during a Nexpert consultation that illustrate what rules have been "fired," the direction Nexpert is heading, and what objects and classes have been affected by the session.

The editors make Nexpert easy to use, but it's the inference engine that gives Nexpert Object its reasoning power. Nexpert's primary inference methodology is called *opportunistic reasoning*. In most expert systems, designers must choose between a forward- or backward-inferencing engine. Backward-chaining systems such as Level5/Macintosh begin their inference with a conclusion, such as "My picture tube is blown." The inference engine then goes backward through the knowledge base, trying to confirm or deny the statement. Most diagnostic systems are backward chaining in nature. Forward-chaining systems, such as Charles Forgey's OPS5 algorithm, take data as input and then search for rules that use this data and try to determine what advice to provide.

Nexpert Object combines these two methods so designers can create expert systems that more precisely emulate the human expert. If you enter `My picture tube is blown` into Nexpert and it proves to be false, Nexpert may recommend, "Fix the color PC board" because during its attempt to confirm that the picture tube was blown, it found that the color PC board was the problem. Nexpert's choice of inference methods depends on static and dynamic strategies that the designer controls. Static strategies globally control what type of information is placed in the knowledge queue. They can be changed by rules and objects to engage or disengage several fact-for-

Anatomy of an Expert-System Shell

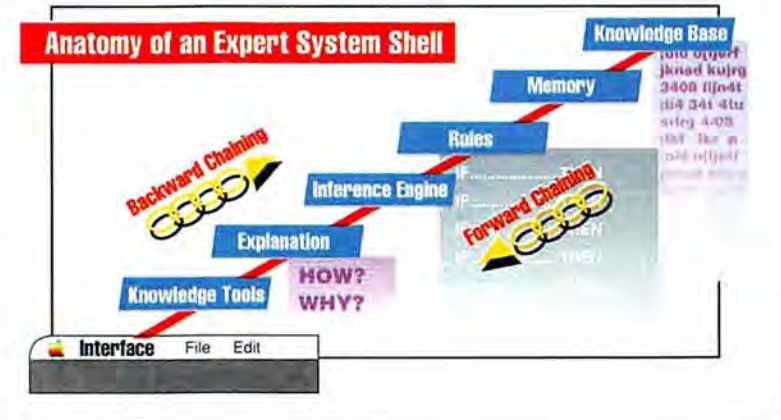
Expert-system shells consist of four basic components: knowledge-acquisition tools, explanation facilities, the system interface, and the inference engine. In combination with the working memory in a computer and a knowledge base, expert systems can perform their reasoning tasks.

In most expert systems, the knowledge-acquisition tools are rule templates that act as guidelines for knowledge engineers. Entering IF/THEN rules about a particular domain of knowledge builds the knowledge base as each rule is entered. Nexpert Object, Intelligent Developer, and Instant-Expert work this way. Some expert-systems shells, such as Level5, have no knowledge-engineering interface and accept knowledge through standard text files. Programs such as MacSmarts can accept both rules and historical data for inducing knowledge. Using an algorithm called ID3, MacSmarts can induce rules from a series of examples entered in a spreadsheet format. ID3 looks for patterns in the examples to find rules. New programs, such as Neuron Data's Nextra, are adding sophisticated automated psychological inquiry techniques to the knowledge engineer's arsenal.

Having rules alone is like having a ticker tape and no broker: They're good to know, but you can't do anything with them. The inference engine of an expert-system shell is what transforms IF/THEN statements into reasonable conclusions. Inference engines come in three varieties: forward chaining, backward chaining, and mixed mode. Forward-chaining expert systems require data to go to the expert system first. As the data is entered, the inference engine searches for rules that the data satisfies. As rules "fire," new conclusions are arrived at by the inference engine, which drives the system closer to a final conclusion. Forward-chaining systems are ideally suited to planning and evaluation problems. Backward-chaining inference engines, such as Level5's, are good diagnostic systems. If you walk into your car dealer and say your car has a burned-out taillight, a backward-chaining inference engine will look for the most-likely cause of the taillight's failure first and then backward-chain deeper into its knowledge base (perhaps suggesting that fuses and wiring be checked) until it confirms or denies your guess. Mixed-mode expert systems such as Nexpert Object combine these two techniques to better approximate the reasoning of a human expert.

When experts reason, you rarely need to ask why they arrived at a particular solution or asked a certain question. But such questions often come up in training situations and are required with automation. During the MYCIN experiments (see main Nexpert article), the Stanford researchers endowed MYCIN with HOW and WHY facilities. These terms have propagated through commercial products. Asking an expert system HOW it came to a conclusion reveals a trace of the rules that led to its advice. Asking WHY a question is being asked tells the expert system to expose its current train of thought.

These three elements, along with the system interface for opening files and printing reports, combine to create the expert-system environment. Only a few lines of code are necessary to implement an expert-system inference engine. Much of the code goes into building the interface. That's because AI researchers and corporations want knowledge engineers to concentrate on creating systems to solve problems, not on entering problems into a system.



Your P.O. is OK with us.

Your corporate, government agency, school system, college, university, or other institutional purchase order is welcome at MacZone. Just fax us your P.O. at (206) 881-3421 and start saving. For help with product information, call us toll-free at (800) 248-0800.



Zone Specials

Preferred Publishers

First full featured desk accessory database for keeping track of text, color images, and graphics.

Database 72.

SIMMs

Do it yourself memory upgrade? No problem! Each set of SIMMs comes with a complete installation manual. Call for current prices.

Osicom

High performance hard disks at an affordable price! Pre-formatted with current system software. Just "plug and play".

MacBest 80 695.

Preferred Publishers

The finest desk accessory text tool & spell checker for word processing, page layout, and databases.

Vantage 55.

Monogram

Integrated business accounting package. General Ledger, Accounts Receivable, Accounts Payable, & Payroll.

Business Sense 268.

Dolphin Systems

High capacity Sony READ-WRITE OPTICAL SCSI removable hard disk drive, with six hundred Megabytes per cartridge.

Sonar 600 4795.

NEC

Dozens of new CD Roms are coming out every month. NEC's excellent drive, is one of best at an unbeatable price.

CD Rom Drive 845.

Best Data

Smart One 2400 baud modem with cable and communications software.

w/Quicklink 145.

w/Red Ryder 189.

Software

3G Graphics - Images w/Impact

Business 1 64.

Graphics & Symbols 1 56.

A. Bonadio & Associates

Expressionist 2.03 78.

ACIUS

4th Dimension 1.06 389.

Adobe

Illustrator 88 297.

Streamline 238.

AEC Management Systems

AEC Information Manager 415.

Affinity Microsystems

Tempo II 79.

Aldus

Freehand 358.

PageMaker 3.0 397.

Persuasion 375.

Alp Systems

Mac Proof 3.21 114.

Alsoft

DiskExpress 1.5 45.

Master Juggler 62.

MultiDisk 45.

Ashton-Tate

dBASE Mac 294.

Full Impact 248.

FullWrite Professional 1.1 264.

Bedford

Simply Accounting 208.

Berkeley System Design

Stepping Out 2.01 51.

Blyth Software

Omnis 5 379.

Bootware Software

ResumeWriter - Professional 60.

ResumeWriter - Student 18.

Borland International

Eureka: The Solver 128.

Reflex Plus 188.

Sidekick 2.0 65.

Turbo Pascal 1.1 67.

Turbo Pascal Tutor 1.0 45.

Bright Star Technology

Hyper Animator 1.5 77.

Brøderbund

PosterMaker Plus 35.

Print Shop 35.

Caere

Omnipage 1.1 558.

Casady & Greene

QuickDEX 31.

CE Software

CalendarMaker 3.0 26.

DiskTop 3.0.4 + LaserStatus & Widgets 26.

MockPackage Plus Utilities 4.4 26.

QuickKeys 1.2 52.

QuickMail 2.0 (1-5 Users) 156.

QuickMail 2.0 (10 Users) 204.

Central Point Software

Copy II Mac 7.2 CALL

PC Tools Deluxe CALL

Check Mark Software

Cash Ledger 125.

MultiLedger 1.3 254.

Payroll 189.

Claris

Claris Cad 625.

FileMaker II 228.

MacDraw II 305.

MacPaint 2.0 99.

MacProject II 377.

MacWrite II 189.

SmartForm Designer 307.

Connect

MacNet CALL

Cricket Software

Cricket Draw 168.

Cricket Graph 1.3 114.

Cricket Presents 285.

DataViz

MacLink Plus w/Cable 4.0 135.

Deneba Software

Big Thesaurus 53.

Canvas 2.0 159.

Coach Professional 104.

Comment 2.0 54.

Dubl-Click

WetPaint - bit mapped clip art

Any two volume set each 43.

World Class Fonts - ImageWriter Fonts

1 & 2 (Originals) • 3 & 4 (The Stylish)

5 & 6 (Giants) • 7 & 8 (Triples) 43.

World Class LaserType - Laser Fonts

Volume 1, 2, 3, 4, 5, or 6 each 43.

Electronic Arts

Disk Tools Plus 30.

Studio Eight 309.

Studio One 98.

Thunder II 49.

Emerald City Software

Smart Art 1 88.

Farallon

Phone Net Check Net 68.

Screen Recorder 129.

Timbuktu 30 Pack 1389.

Timbuktu Remote 194.

Timbuktu Single User 64.

Traffic Watch 135.

Fifth Generation

Fast Back II 107.

PowerStation 2.5 29.

Pyrol 3.3 14.

Suitcase II 44.

Foundation Publications

Comic Strip Factory 39.

Comic People (Vol. 1 - Office Days) 22.

Fox Software

FoxBASE+/Mac 2.0 CALL

FoxBASE+/Mac Multi User 2.0 CALL

FoxBASE+/Mac Runtime 2.0 CALL

FreeSoft

Red Ryder 10.3 53.

Red Ryder Host 2.0 CALL

Generic Software

Generic CADD Level 1 84.

Hayes

Smartcom II 3.0 87.

HJC Software

Virex 65.

ICOM Simulations

HyperTMON 59.

On Cue 1.3 35.

TMON 2.8.2 89.

Individual Software

101 Macros For Excel 36.

101 Scripts & Buttons for HyperCard 36.

Informix

WingZ! 269.

Infosphere

Liaison 198.

Innovative Data Design

Dreams 269.

MacDraft 1.2b 144.

Insight Development

MacPrint 75.

Insignia Solutions

Soft PC 245.

Intuit

Quicken 32.

Jam Software

Smart Alarms Multiuser CALL

Smart Alarms Single User 54.

Kent Marsh

MacSafe or Night Watch each 87.

Letraset

ImageStudio 274.

LetraStudio 288.

ReadySetGo! 4.5 274.

Mac Master

FEdit + 1.07 28.

Meca

Managing Your Money 2.0 124.

Mediagenic

Focal Point II 118.

QuickLetter 74.

Reports 1.2 69.

Microlytics

GOfer 43.

WordFinder 32.

Microseeds

Redux 54.

Screen Gems 44.

Microsoft

Excel 2.2 255.

File 2.0 125.

PowerPoint 2.01 249.

Quick Basic 1.0 65.

Word 4.0 249.

Works 2.0 188.

Write 78.

Monogram

Business Sense 1.2 268.

Dollars & Sense 4.1 79.

Nolo Press

For The Record 29.

Will Maker 3.0 32.

North Edge

Time Slips III 169.

Odesta

Data Desk Professional 2.0 285.

Double Helix Release 2 337.

GeoQuery 1.0 198.

Olduvai Software

MultiClip 55.

Read-It! 2.0 249.

Read-It! Personal 98.

ParagonCourseware

Nisus 249.

QUED-M 99.

MacZone makes network news.

Networking your Macs is a terrific way to share everything from information to laser printers. And, thanks to the network wizards at MacZone, putting together a network is easy and affordable.

Here at the Zone, we're networked ourselves. So we're well qualified to help you figure out exactly what products you need to connect your Macs—from PhoneNET to Ethernet.

But that's only the beginning. Because we're also available to help you get your network laid out, hooked up, and running. All at our usual low MacZone prices. Order \$398 or more worth of any MacZone products and get one of our Cable Kits (retail value: \$29.95) absolutely free.

So if you want to connect your Macs, start by connecting with us at (800) 248-0800. You can even email your order to us via Compuserve (73667,3636) or GENie (MACZONE)—we check our mail hourly.



Farallon Network Products

Timbuktu lets you control or observe any Mac on the network—including monitor-less file servers. Ideal for classroom settings, training situations, or troubleshooting networked Macs. Runs on any network, from AppleTalk to Ethernet. Timbuktu Remote provides the same capabilities from a remote computer. Farallon's AppleTalk-compatible PhoneNET StarController provides consistent network speed and makes it easy for you to expand your network using normal phone wiring. See prices in ad.



TOPS FlashBox & Software

Triple your AppleTalk network's speed with the TOPS FlashBox. And TOPS software allows multiple file sharing from any drive on the network. See prices in ad.



Dove FastNet Cards

Ethernet cards for coax or twisted-pair Ethernet. Some of the fastest cards at some of the best prices you'll find anywhere. For any Mac from Plus through II. See prices in ad.



David Express Net

An inexpensive way to network Macs using a Star controller twisted-pair Ethernet hub. Provides network speeds of 10 megabits using standard phone cable. Call for a price quote.

MacZone Networking Brochure: FREE!

An in-depth look at exactly what the MacZone networking experts can do for you. Includes an overview of our networking products, examples of installations, and an outline of our network installation services. Call for your copy today.



MacZone Cable Kit: FREE!

Connect your Macs using normal phone wire. Fully AppleTalk, PhoneNET Plus, and TurboNet ST compatible for just \$17.95 or order at least \$398 worth of any MacZone products and get our cable kit free.

*While supplies last

Product Guarantees:

If you are not completely satisfied with a purchase, many of the products we sell come with a 30 to 60 day money back guarantee. Ask for details when you place your order.

1-800-248-0800

Canada: 800-248-0344 FAX (206) 881-3421

Our savings are huge. Our advice is free.



Come to the Zone for wonderful memories.

Memory prices are down. Which makes this a perfect time to order SIMMs from MacZone. Our step-by-step manual and friendly phone advice make it easy to add memory yourself. So get more out of your Mac. Remember to call us for a memory upgrade today.



Harrier Strike Mission II	31.
Puzzle Gallery 'At The Carnival'	28.
Mindscape	
Aussie Joker Poker, Balance Of Power	
1990, Colony, Crossword Magic, Deja	
Vu, Deja Vu II, Gauntlet, Shadowgate,	
Trust And Betrayal, Uninvited	29.
PBI Software	
NetTrek or Strategic Conquest 2.0	34.
PCAI	
Lunar Rescue	33.
Mac Racquetball	36.
MacCourses	28.
MacGolf	34.
MacGolf Classic	52.
Road Racer	38.
Shodan	
Leprechaun	36.
Silicon Beach Software	
Apache Strike	26.
Dark Castle or Beyond Dark Castle	29.
Software Toolworks	
Hunt For Red October	31.
Sphere	
Falcon 2.0	31.
Gato 1.4, Orbiter, or PT-109	26.
Solitaire Royale (Color or B & W)	19.
Tetris (Black & White)	20.
Tetris (Color)	24.
Spinnaker	
Sargon IV	28.
Three Sixty	
Warlock	29.

Education

Bible Research Systems	
The Word (KJV, NIV, NKJV, RSV)	164.
Bright Star Technology	
Alphabet Blocks	30.
Talking Tiles	63.
Brøderbund	
Calculus, Geometry, or Physics	ea. 58.
Type!	19.
Davidson & Associates	
Math Blaster	26.
Great Wave Software	
KidsTime	25.
Number Maze	26.
Learning Company	
Reader Rabbit 2.1	32.
Mindscape	
S.A.T. Perfect Score	45.
Nordic	
Alphabetizer, Bodyworks, Clockworks,	
Coinworks, Earthworks, Flashworks,	
Lemonade Stand, Naval Battle,	
Preschool Disk 1, Preschool Disk 2,	
Turbo Math Facts, Word Search	ea. 27.
Simon & Schuster	
Typing Tutor IV	34.
Spinnaker	
Typing Made Easy	25.
True Basic	
Algebra, Arithmetic, Calculus, Discrete	
Mathematics, Pre-Calculus/	
Trigonometry, Probability Theory,	
TrueSTAT	33.

Music

Ars Nova	
Practica Musica 2.07	74.
Bogas Productions	
Super Studio Session	69.
Studio Session	48.
Brass, Country, Heavy Metal, Sound	
Effects, String Quartet	each 14.
Brøderbund	
Jam Session	28.
Coda	
Finale 1.2.6	475.
Mac Drums	29.
Perceive	49.
Electronic Arts	
Deluxe Music Construction Set 2.5	84.
Farallon	
MacRecorder	CALL
Great Wave Software	
ConcertWare Plus	38.
ConcertWare Plus MIDI	77.
Mark Of The Unicorn	
Professional Composer 2.2	395.
Professional Performer 3.0	395.
Passport Designs	
Click Tracks	309.
MasterTracks Jr.	99.
MasterTracks Pro 3.3	258.
Note Writer	185.
Passport MIDI Interface	97.
Passport MIDI Transport	340.
Resonate	
Listen 2.1	69.

Accessories

Abaton	
Pro Point ADB	89.
Addison Wesley	
Inside Macintosh	
Volumes 1, 2, 3, & 4	each 21.
Volume 5	23.
Cross Reference	15.
Macintosh Programming Secrets	19.
American Power Conversion	
UPS 110SE	325.
Bantam Books	
Illustrator 88: O'H! Designers Handbook	19.
Mastering WingZ!	21.
Complete HyperCard Handbook (2nd Ed)	22.
DataDesk International	
Mac 101 Keyboard - for all Macs	144.
Datashield	
MacDirector	114.
Ergotron	
MacTilt	68.
Mouse Clean 360°	14.
Fujitsu	
800k Disk Drive (Platinum)	155.
Golden Ribbons	
ImageWriter Ribbon - Black	4.
ImageWriter II Multi Colored Ribbon	8.
Kalmar Designs - Teak Disk File	
Holds 45 Disks	14.
Holds 90 Disks	21.
Holds 135 Disks	31.

Kensington Microware

System Saver Mac Fan	64.
Turbo Mouse - for all Macs	109.
Kraft	
Joystick - for all Macs	49.
Mac Packs - Gray, Navy, or Wine	
ImageWriter Bag	45.
Mac Plus/SE Bag	55.
Mac SE Bag XI (Extended Keyboard)	69.
Mac Zone	
7 Outlet Noise & Surge Protector	24.
Mouse Pad - Black, Blue, Gray, Red	6.
SCSI Tester	39.
Mac Tool Kit w/Grounding Strap	15.
Mobius	
Fanny Mac (Beige or Platinum)	59.
MSC Technologies	
A+ Mouse (512k & Plus)	65.
A+ Mouse ADB	85.
Orange Micro	
Grappler C/Mac/GS	78.
Grappler Mac LQ	99.
Grappler Mac LS	99.
Grappler Spooler	38.
ScanCo	
Mac Table w/Cabinet (w/Shipping)	445.
Sony Discs	
40 Meg Dc-2000 Tape Cartridge	23.
Double Sided - 10 Pack	14.
Double Sided - Bulk (Units of 50)	ea. 1.29
High Density - 10 Pack	36.
High Density - Bulk (Units of 50)	ea. 3.25
TEAC	
60 Meg Backup Tape (Ct600h)	19.
Williams & Macias	
myDiskLabeler (ImageWriter)	29.
myDiskLabeler (LaserWriter)	33.
Sticky Business	95.

Ordering Information

Our phone lines are open for orders.

Monday - Friday: 6AM to 8PM PST
Saturday: 8AM to 5PM PST

Products ordered before 7:30pm EST (4:30pm PST) shipped the same day.

We accept VISA, MASTERCARD, AMERICAN EXPRESS & OPTIMA Card. **No surcharge added.**

- If we must ship a partial order, we never charge freight on the shipments that complete the order (U.S. only).
- Your credit card will not be charged until products ship.
- Personal and company checks under \$1,000 clear immediately. Allow one week for checks over \$1,000.
- Fortune 1,000 and Government checks clear immediately.
- Fortune 1,000, Government, School and Institutional PO's clear immediately.
- No sales tax (except WA residents add 8.1% to total including shipping).
- Loan drives subject to availability.
- All prices subject to change without notice.
- All items subject to availability.

Shipping Information

- Shipping: \$3.00 for Federal Express Standard Overnight Service. Packages under 6 lbs overnight, over 6 lbs. second day air.
 - APD/FPO orders shipped 1st class mail, charged by weight.
 - Overseas: We ship anywhere in the Free World, using quickest & least expensive methods possible. Second day air service available to most of Europe, Australia, & Japan.
 - Software and hardware is subject to manufacturer's warranty. Defective items will be replaced immediately with like item.
 - All returns must have an authorization number.
- ©1989 Multiple Zones International
The MacZone is a trademark of Multiple Zones International
6825 176th Ave. N.E. Suite 100, Redmond, WA 98052

Zone Specials

Logitech

Use your Macintosh for digitizing with this highly capable hand-held 400 dpi scanner at a great Zone price
Scan Man 345. |



HJC Software

Virus detection & treatment. Regular version upgrades makes this the most up-to-date virus killer.
Virex 65. |



Insight Devel.

Now you can print any Macintosh application on a Hewlett Packard Laser Jet II, IID, or Desk Jet printers.
MacPrint 75. |



Quantum Drives

Expect only the best in high performance hard disks from the MacZone. Same as used in the SE-30 and IICX
Quantum 80 790. |



Deneba Software

For professionals in business, design, graphics & engineering, with many features found in higher priced packages.
Canvas 159. |



Shodan

Charming and challenging 256-color arcade/puzzle game with digital sound. Suitable for all ages and abilities.
Leprechaun 36. |



Microseeds

Hard disk backup program especially made for both novice and power users. Easy to use and fast enough to use regularly.
Redux 54. |



Silicon Beach

Goes way beyond HyperCard with multiple cards of almost unlimited size, color, graphic objects and much more.
SuperCard 134. |



Overnight delivery is no big deal at the Zone.

The way some companies talk, you'd think they were the only ones with \$3 Federal Express overnight shipping. But it's standard procedure at MacZone. So if you order something today, you'll probably get it tomorrow (some heavy items like monitors and scanners may take a day longer). See? No big deal.



Peripherals Computers & Supplies

Versa Term Pro 2.20	189.
Versa Term 4.0	96.

Personal Bibliographic

ProCite	198.
---------	------

Power Up!

Fast Forms Construction Kit	98.
-----------------------------	-----

Preferred Publishers

DAtabase	72.
Vantage	55.

ProVUE

Panorama	202.
----------	------

Quark

QuarkStyle	175.
XPress 2.1	495.

Silicon Beach Software

Digital Darkroom	249.
Silicon Press	48.
Super 3D 2.0 (Color)	297.
Super Card	134.
Super Paint 2.0	128.

SmethersBarnes

ProtoType 2.0	CALL
---------------	------

Software Ventures

Microphone 1.5	109.
Microphone II Verston 3.0	219.

Solutions

backFax	125.
Curator	74.
SmartScrap & The Clipper 2.0	45.
Super Glue 1.05	48.

SuperMac Software

Disk Fit 1.5	53.
Network Disk Fit	198.
PixelPaint 2.0	229.
Sentinel 2.0	88.
SuperLaserSpool - Multi User (1 to 5)	235.
SuperLaserSpool 2.0 - Single User	78.
SuperSpool 5.0	53.

Survivor Software

MacMoney 3.1	60.
--------------	-----

Symantec

Just Enough Pascal	48.
Lightspeed C 3.02	159.
Lightspeed Pascal 2.0	83.
MacSQZ! 2.2	CALL
More II	249.
S.A.M. (Symantec AntiVirus for Macintosh)	65.
S.U.M. (Symantec Utilities for Macintosh)	65.

Symmetry

Acta Advantage	64.
HyperDA 1.1	34.
Picture Base 1.2 & PB Retriever	54.

T/Maker

WriteNow 2.0	109.
--------------	------

TML Systems

TML Pascal II 3.0 (w/MPW 3.0)	109.
-------------------------------	------

TOPS

InBox Personal Connection 2.2	44.
InBox 2.2 Starter Kit	148.
NetPrint 2.0	117.
TOPS DOS	117.
TOPS MAC	145.

Traveling Software

Lap-Link Mac 2.0	82.
------------------	-----

True Basic

3-D Graphics Toolkit	45.
Business Graphics Toolkit	45.
Scientific Graphics Toolkit	45.

True Basic 2.01	55.
-----------------	-----

U.S. Micro Labs

FontSizer	65.
-----------	-----

WordPerfect Corp.

WordPerfect 1.02	185.
------------------	------

Xerox (DataCopy)

AccuText	745.
----------	------

Zedcor Inc

DeskPaint/DeskDraw 2.0	65.
ZBasic 5.0	98.

Hardware

Abaton

InterFax 12/48 Fax/Modem	305.
Quick Step CrystalPrint Publisher 3295	
Scanner 300/GS (8 Bit - 256 Grays)	1495.
Scanner 300S (4 Bit - 16 Grays)	1198.

Best Data

Smart One 2400 Baud Modem	165.
Smart One 2400 w/Red Ryder	199.

CDC (Fastest Hard Disk Available)

CDC 135 Meg (3 1/2" Drive)	1795.
CDC 172 Meg (3 1/2" Drive)	1995.
CDC 150 External	1798.
CDC 300 External	2398.
CDC 600 External	2998.

CMS

MacStack 20	399.
MacStack 30	545.
MacStack 43	598.
TapeStack 60 (SCSI Tape Backup)	725.

Connor

Zone 100	946.
----------	------

Daystar Digital

16MHz 030 Accelerator SE	975.
25MHz 030 Accelerator SE	1595.
33MHz 030 Accelerator SE	2395.
Daystar 33/030 Accelerator II or IIX	
w/Math Co-Processor	5280.
Lt 200 Mc LocalTalk Board	279.
Lt 200 PC LocalTalk Board	179.

Dolphin

Flipper 44mb Removable	1075.
Sonar 600mb (Read Write Optical)	4795.

Dove

FastNet AE	1249.
FastNet II	365.
FastNet III	545.
FastNet LAN/020	895.
FastNet SCSI	749.
FastNet SE	365.
FastNet SE/30	375.
MacSnap 524 (512k to 1mb)	192.
MacSnap 524e (512kE to 1mb)	189.
MacSnap 524s (512kE to 1mb w/SCSI)	240.
MacSnap 548 (512k to 2mb)	432.
MacSnap 548e (512kE to 2mb)	419.
MacSnap 548s (512kE to 2mb w/SCSI)	479.
SCSI Port Adapter	109.

Marathon 020 Accel.SE - 16 MHz

MSE1 (Accelerator only)	584.
MSE2 (...w/1mb)	720.
MSE3 (...w/Math Co-Processor)	774.
MSE4 (...w/Math Co-Proc. & 1 Mb)	899.
Marathon 030 Accelerator	
for Mac II - 32MHz	975.

Farallon

PhoneNet - DIN-8 or DB-9	34.
--------------------------	-----

PhoneNet - DIN-8 (10 Pack)	224.
----------------------------	------

Repeater	298.
----------	------

Star Controller	1145.
-----------------	-------

Irwin

Excelsior XI 25 MHz	1280.
---------------------	-------

Macintosh

2 One Mb SIMMs (100 Ns)	CALL
-------------------------	------

256k SIMMs (120 Ns)	CALL
---------------------	------

Magnavox

Color Monitor 14" Analog	535.
--------------------------	------

Motorola - Math Co-Processor

68882 - 16MHz	293.
---------------	------

68882 - 25MHz	425.
---------------	------

68882 - 33MHz	695.
---------------	------

NEC

CD Rom Drive	845.
--------------	------

NEC MacSync 14" Color Monitor	675.
-------------------------------	------

Nuvotech

Turbo Bridge	339.
--------------	------

Turbo Net - DB-9 or DIN-8	21.
---------------------------	-----

Turbo Net ST - DB-9 or DIN-8	29.
------------------------------	-----

Orchid Technology

Fax Modem 9600/9600	448.
---------------------	------

Mac Sprint II, Cache Card	249.
---------------------------	------

Osicom Technologies

MacBest 20 External	439.
---------------------	------

MacBest 30 External	525.
---------------------	------

MacBest 40 External	589.
---------------------	------

MacBest 60 External	685.
---------------------	------

MacBest 80 External	695.
---------------------	------

MacBest 90 External	965.
---------------------	------

MacBest 170 External	1695.
----------------------	-------

MacBest 30 Internal Mac SE/II	425.
-------------------------------	------

MacBest 45 Internal Mac SE/II	489.
-------------------------------	------

MacBest 60 Internal Mac II	555.
----------------------------	------

MacBest 80 Internal Mac II	625.
----------------------------	------

MacBest 90 Internal Mac II	865.
----------------------------	------

MacBest 150 Internal Mac II	1398.
-----------------------------	-------

MacBest 170 Internal Mac II	1595.
-----------------------------	-------

MacBest 300 Internal Mac II	1995.
-----------------------------	-------

MacBest 600 Internal Mac II	2885.
-----------------------------	-------

PLI (Peripheral Land, Inc.)

Infinity 40 Turbo Removable	1235.
-----------------------------	-------

Infinity 40/40 Turbo Removable	2195.
--------------------------------	-------

TurboFloppy 1.4	339.
-----------------	------

Quantum (Internal Hard Disks)

Quantum 40	439.
------------	------

Quantum 80	790.
------------	------

Quantum 105	998.
-------------	------

RasterOps

Colorboard 108+	1249.
-----------------	-------

Colorboard 108+/SE/30	1439.
-----------------------	-------

Colorboard 104 (24 Bit Color)	3895.
-------------------------------	-------

Colorboard 224 (32 Bit Color)	4295.
-------------------------------	-------

RasterOps/Trinitron 19"	3398.
-------------------------	-------

TrueCapture 324	1995.
-----------------	-------

Sharp

JX 450 Color Scanner	5895.
----------------------	-------

Shiva Corporation

Net Serial	289.
------------	------

NetBridge	289.
-----------	------

NetModem V2400	455.
----------------	------

TeleBridge	348.
------------	------

SummaGraphics

Bit Pad Plus (12" x 12" Tablet - ADB)	324.
---------------------------------------	------

SupraCorp.

Supra Modem 2400 Baud	145.
-----------------------	------

Syquest

Infinity 44 Cartridges Unformatted	115.
------------------------------------	------

Taxan (Eddy Award Hon. Mention)

Crystal View II	1395.
-----------------	-------

Crystal View SE	1395.
-----------------	-------

Crystal View SE/30	1395.
--------------------	-------

Ultra Vision 1000 Color	1395.
-------------------------	-------

Telebit

T-1000 9600 Bps Modem	699.
-----------------------	------

T-2000 19,000 Bps Modem	1199.
-------------------------	-------

T-2500 V.32 w/P.E.P.	
----------------------	--

19,000 Bps Modem	1299.
------------------	-------

Thunderware

Lightning Scan	405.
----------------	------

ThunderScan 5.0	188.
-----------------	------

TOPS

TOPS Flash Box	122.
----------------	------

TOPS Flash Card (for TOPS DOS)	162.
--------------------------------	------

TOPS Repeater	125.
---------------	------

TOPS Teleconnector - DB-9 or DIN-8	36.
------------------------------------	-----

U.S. Robotics

2400 Baud Modem	348.
-----------------	------

9600 Hst Baud Modem	685.
---------------------	------

Xerox (Datacopy)

Datacopy 730GS (Gray Scale Scanner)	1545.
-------------------------------------	-------

Entertainment

Access Software

World Class Leader Board 4.0	27.
------------------------------	-----

Accolade

4th & Inches, Hardball, Mean 18 ea	27.
------------------------------------	-----

Braderbund

Ancient Art Of War or War At Sea	26.
----------------------------------	-----

Autoduel, Moebius, Shufflepuck	23.
--------------------------------	-----

Sim City 1.1	27.
--------------	-----

Where In The...	
-----------------	--

...U.S.A. Is Carmen Sandiego?	27.
-------------------------------	-----

...World Is Carmen Sandiego?	27.
------------------------------	-----

Bullseye Software

Ferrari Grand Prix	32.
--------------------	-----

P-51 Mustang Flight Simulator	31.
-------------------------------	-----

Casady & Greene

Crystal Quest 2.2	25.
-------------------	-----

Crystal Quest 2.2 w/Critter Editor	41.
------------------------------------	-----

Centron

Casino Master B & W	44.
---------------------	-----

Casino Master Deluxe Color	49.
----------------------------	-----

How to avoid making backups.

Make Irwin® do it.

An Irwin tape backup system, that is.

So go home early. Because an Irwin system will back up your data, your programs, your breakthrough ideas—all automatically.



No complicated commands.

No sloppy floppies.

Our EzTape® software makes it easy to store

whatever data you want. Whenever you want.

It doesn't matter whether you're backing up a Macintosh® or a PC.

An Irwin backup system works with them all. Along with all the popular local area networks. Providing up to 150 megabytes of reliable storage.

In fact, with its patented AccuTrak® precision tracking technology, you can transfer data from a Mac to a PS/2® to a PC and back again.

Something that would throw a floppy right off its track.

All in all, that's why more people rely on Irwin minicartridge systems to do their backup than all others combined.

Just call 1-800-BACKUP1 for the dealer nearest you.

Because the best way to make backups is to avoid it.

IRWIN®

A Cipher Products Group

© Copyright 1989, Irwin Magnetic Systems, a subsidiary of Cipher Data Products, Inc. 2101 Commonwealth Blvd., Ann Arbor, MI 48105. Irwin, EzTape and AccuTrak are registered trademarks of Irwin Magnetic Systems, Inc. PS/2 is a registered trademark of International Business Machines Corporation and Macintosh is a registered trademark of Apple Computer, Inc.

Please circle 31 on reader service card.

The Expert Is In



Figure 2: An overview of the rule network shows how complex a system can become. The miniature overview can help you move around within the actual rule network. This display is from an expert system for evaluating AI projects. This pop-up menu illustrates navigation throughout Nexpert.



Figure 3: Nexpert's object browser provides a vivid depiction of the object world within a knowledge base. This screen shot clearly shows a factory, its machinery, and its staff. The factory class has properties that are not inherited by its subclasses. Machines and staff, however, show the inheritance of properties through specific machines and people. The Windows editor overlaying the object-network overview demonstrates the convenience built in to the Nexpert Object environment.

warding mechanisms, such as forward chaining on false rules or explicit actions described in a rule or object. Several tools, including Current Rule, Current Hypothesis, Transcript, and Full Report windows, give developers insight into Nexpert's reasoning methods. A skilled Nexpert developer can also use the Rule Network to watch the progression of newly programmed sets of inferences.

Working through a problem seri-

ally, however, is not what makes an expert an expert. The capacity to adapt is what's important. Like human experts, Nexpert Object has the ability to rethink a problem as situations change. This ability, known as non-monotonic reasoning, allows facts to be forgotten and beliefs to be revised, based on the condition of a model. *If Change* slots in Nexpert objects are invoked when an object's value is changed. These slots enable non-monotonic reasoning because they're the first to detect a change in the surroundings.

LISP-based products such as ART and KEE allow designers to drop into the LISP programming language to modify the expert-system environment. Although Nexpert does not have interactive language extensions as LISP shells do, Nexpert's open interface accommodates programs or specific functions written in C or Pascal. In an expert system for manufacturing, for example, it could incorporate a C routine that performed mathematical visualization functions that would be difficult, if not impossible, in the Nexpert environment.

For many users, outside programs may hold little interest, but outside databases are a key concern. Nexpert's ability to integrate with databases far surpasses that of any tool in its price range. Nexpert can communicate with SYLK spreadsheet/database files, Excel files saved in Lotus 1-2-3 format, or Oracle through Structured Query Language (SQL). With the CL/I connectivity language, Nexpert can retrieve records from mainframe and mini-computer SQL databases.

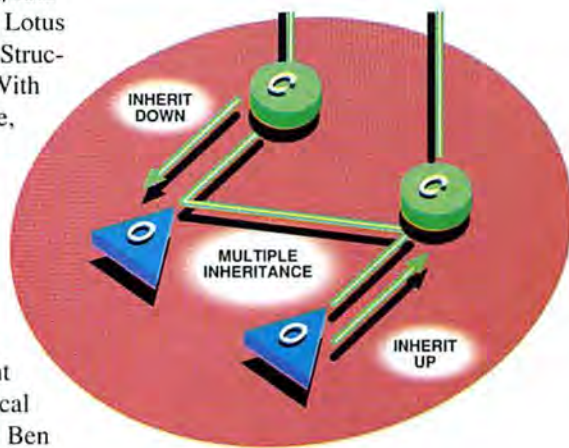
No Objections

Creating objects is Nexpert's way of representing the world. You can easily represent a coffee table or the philosophical gleanings of Rabbi Moses Ben

Maimon as a Nexpert object. Nexpert's abundant object base consists of classes, subclasses, objects, sub-objects, and properties. No other expert system running on a standard Mac has the object-creation and inheritance talents of Nexpert Object.

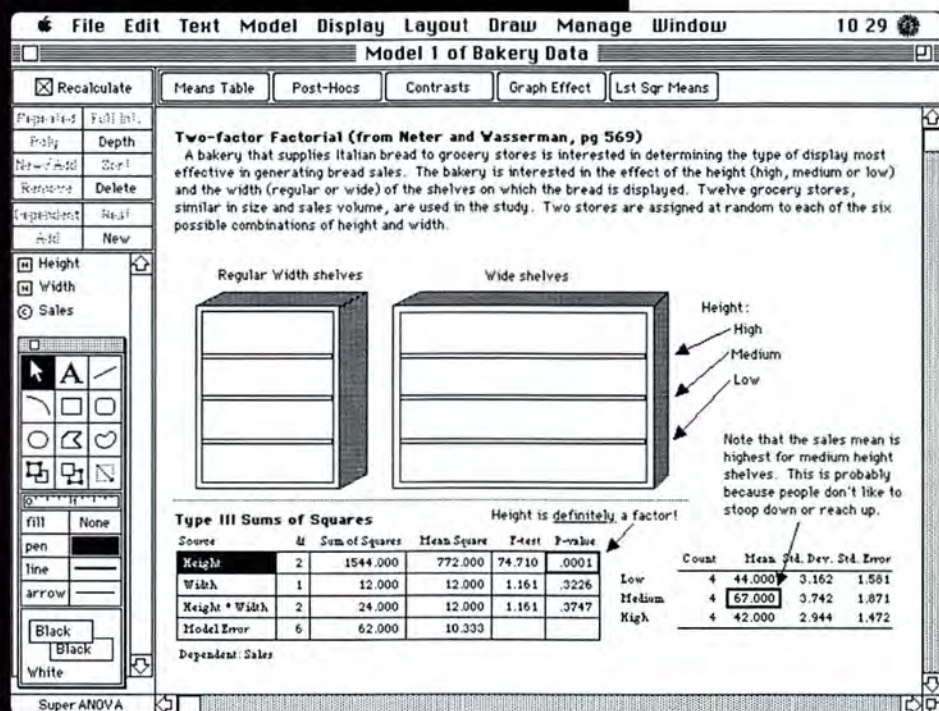
The highest level of object abstraction in Nexpert is the class. A class in Nexpert is similar to a class in taxonomy. All members of a class have certain things in common, although there may be local variations. Say you have a class of all tables. The class has several properties related to it, such as color, number of legs, and style. The local variations can be subclasses or objects. Subclasses are fine-tunings of the class. A subclass of tables might include all country-French tables, all modern tables, or all sixth-century-B.C. dirt tables of Gondwannaland.

Class and object properties not only store values but also have control mechanisms that they use during an inference session. These control mechanisms are called *meta-slots*. When an object, such as a table, is linked to a class, it inherits properties and meta-slots. The washed-pine country-French table that resides in my living room is an instance of the table class. This particular country-French table, when represented in an expert system, inherits the properties



SuperANOVA

Accessible General Linear Modeling for the Macintosh™



- ANOVA, ANCOVA
- MANOVA, MANCOVA
- Multiple regression
- Repeated measures using multivariate or univariate methods
- Interaction and residual plots
- Means tables
- Unbalanced and missing cell designs
- A priori contrasts
- Post hoc means tests, including Tukey's HSD, Tukey Compromise, Duncan's New Multiple Range, Games-Howell, Fisher's LSD, Scheffé's S, SNK, and others
- Design and save models for later application to different data sets
- Canned model designs, including repeated measures, Latin squares, and split-plots
- A complete Macintosh interface

SuperANOVA is a *revolutionary* implementation of general linear modeling. Now you can easily build complex models without learning a command language.

SuperANOVA is from Abacus Concepts, the developers of the award-winning StatView® line of statistical software for the Macintosh.

List Price: \$495.00

Minimum system requirements: Macintosh Plus, one meg RAM, and hard disk. An optimized version is available for the Macintosh II family. Please call for details.

ABACUS
CONCEPTS

1984 Bonita Avenue • Berkeley, CA 94704
(415) 540-1949



Panorama Will Permanently Alter Your Viewpoint On Flat-File Databases

If you have the impression that all flat-file databases are pretty much alike, you're in for a big surprise. True, you can use any database to simply store and retrieve information, but that's where the similarities between Panorama and ordinary flat-file databases comes to an abrupt halt.

What makes Panorama so formidable is its spreadsheet-like analysis features that give you the power to unlock the secrets hidden in your data. In seconds a mass of sales figures becomes a valuable report ranking your top customers. Or, just as easily, Panorama tells you who your hottest salesmen are, what products are your biggest money-makers, or what regions have the fastest growth. **Instead of just storing data, Panorama uses it to reveal the kind of useful information you need to get an edge on the competition.**

Of course, data analysis isn't Panorama's only strength—it's got everything you'd expect in a full featured database and then some.

Panorama's blazing speed, data entry shortcuts (including **Clairvoyance**®), full palette of form design tools, mail-merge capabilities, macro recorder, Flash Art™ and semi-relational features have earned it accolades in review after review. In fact, MacUser editors were so impressed they selected Panorama as their **1988 "Eddy" Award Winner** in the flat-file category. So climb aboard—let Panorama start paving your road to success today!

Demo Video Only \$9.95*

Now you can watch the same 30 minute Panorama demo that has captivated packed audiences at user groups and trade shows all over the country. Call us today to order your copy of this informative VHS tape, or send your name, address and payment to:

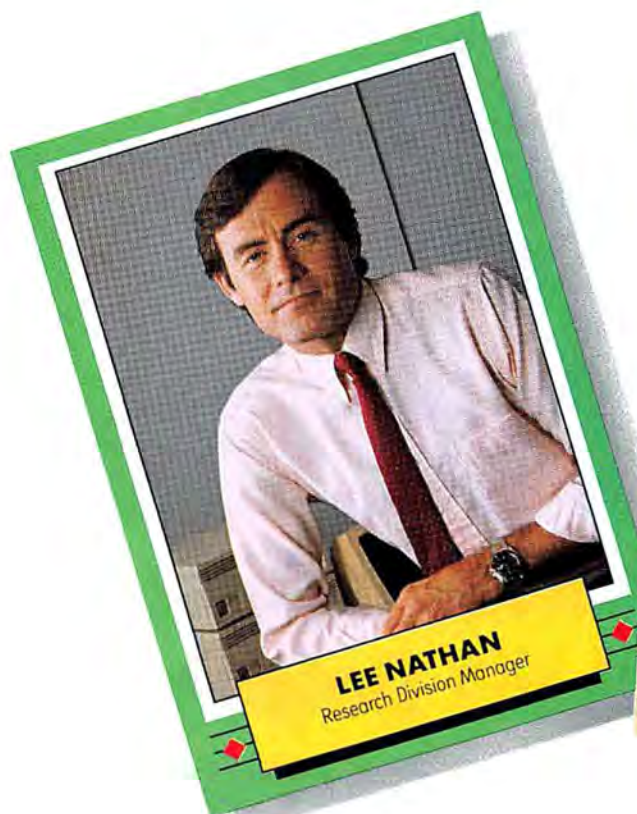
PROVUE DEVELOPMENT
15180 Transistor Lane
Huntington Beach, CA 92649
(714) 892-8199

*Price refundable with purchase of Panorama.
CA residents add 6% sales tax.



Please circle 22 on reader service card.

Big-league stats for the serious player.



LEE NATHAN
Research Division Manager

CAREER HIGHLIGHTS:

- 1982** Used SPSS data analysis system on VAX™ mainframe for customer surveys. Eliminated outside costs of more than \$75,000.
- 1984** Designed sales-lead tracking system, using SPSS data management and charts. Slashed overhead costs—and gave more accurate results in half the time.
- 1986** Promoted to Manager of corporate-wide research and strategic planning staff, in recognition of outstanding contributions to overall profits.
- 1988** Put Macs on employee desktops, dramatically boosting productivity.

Another Story in the SPSS SUCCESS SERIES

When you want more data analysis power from your Macintosh®, the only game in town is SPSS.®

When you've got to know the score, you need more than an ordinary stat package. You need the most powerful data analysis software ever created for the Macintosh: SPSS.

Only SPSS for the Macintosh gives you all the same analytical capabilities as our legendary SPSS mainframe and workstation software.

So you get more ways to turn data into knowledge.

Our Macintosh user interface puts you in control of data and file management. Basic and advanced statistical procedures like time series analysis and forecasting, nonlinear regression, discriminant analysis and more. Plus award-winning presentation graphics and tables to let you display your results.

In short, you get more statistical methods and features with SPSS than with any other Mac software.

And SPSS also gives you one other

vital feature: the SPSS support team that's come through for over a million users in the last 20 years.

So if you're serious about winning, don't settle for anything less than the power you need. Find out more about SPSS by calling

[312] 329-3303.

And get the knowledge to be first in your field.

SPSS inc.

Best in the final analysis.

444 North Michigan Avenue, Chicago, Illinois 60611
SPSS International BV: Avelingen West 80,
P.O. Box 115, 4200 AC Gorinchem,
The Netherlands

of color, number of legs, and style from the table class.

Inheritance in Nexpert does not occur in one direction only. The ability to inherit values from "children" is one of Nexpert's important differences from other object systems. Called upward inheritance, this ability can be applied in the design when several objects suggest a class after they are entered. A value such as the color might be inherited by a "parent" object called *table* if the color of the legs is always determined first. Nexpert's inheritance schemes can be fully controlled with rules and meta-slots.

Every Nexpert object or class that is born without a property is automatically given a property called *value*, which is a generic property that is used in objects that have no definition and cannot be inherited. Such an object with no parent or child objects is called a *flat object*. Properties in Nexpert, like classes, do not hold information themselves; they are only definitions. The property *hypo* might be created for all hypotheses. This property resides in the system as a simple Boolean description until it is attached to an object in the following way: `Determine_Windows_Covering.hypo`, at which time it can receive a TRUE, FALSE, or NOTKNOWN value.

Meta-slots are Neuron Data's implementation of classic AI methods called demons, which are suspended processes that wait for a particular kind of event to occur. When it does, they automatically perform their job and either terminate or suspend themselves, waiting for the next event. You access meta-slots by clicking on the meta-slot box in the object editor or by calling the meta-slot editor from the Edit menu. All demons are stored in the If Change or Order of Sources slots of the proper-

ties. An If Change slot is invoked only when the value of a slot changes. Order of Sources slots determine where an object will look for its value.

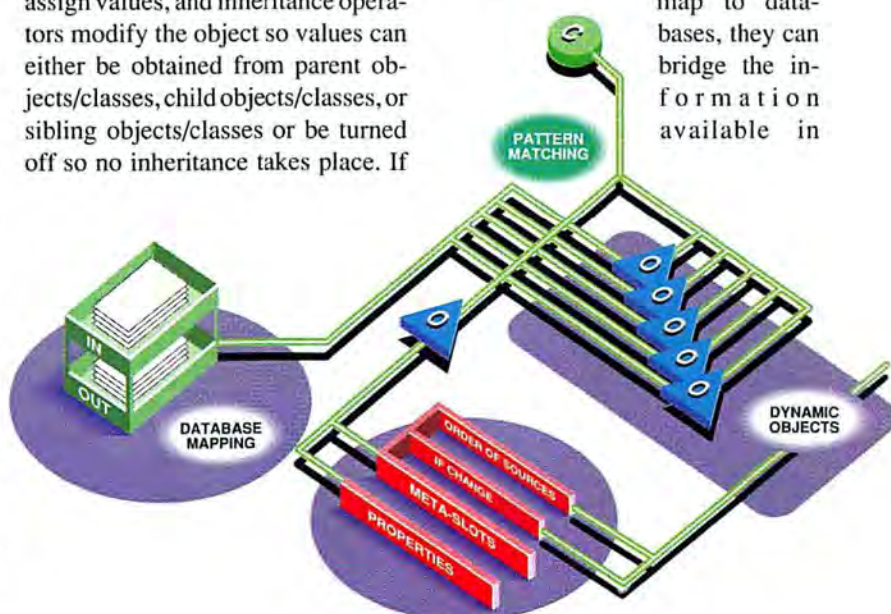
Immediately after the value of an object property changes, the If Change slot is invoked. The If Change slots connected with properties can assign values through LET and DO; force backward chaining by invoking a rule's hypothesis with DO; reset rules, objects, or strategies through Reset and Strategies; or perform 11 other Nexpert functions. If Change slots are very important to real-time expert systems that monitor operations. If the voltage an instrument measures changes from 50 to 60 volts, that condition may require a completely new look at the world. By writing an If Change slot that evaluates the value of a voltage every time it changes, Nexpert can always process the best rules for its current situation. The If Change slots are executed sequentially until all functions have been performed.

The Order of Sources slot is also in the meta-slot editor, and it tells a Nexpert property how to obtain a value. Default values can be established with InitValue. DO and LET assign values, and inheritance operators modify the object so values can either be obtained from parent objects/classes, child objects/classes, or sibling objects/classes or be turned off so no inheritance takes place. If

nothing is entered into the Order of Sources slot, the system first looks backward for rules that will establish a value and then at inheritance from parent objects. If upward inheritance is established, it will try to inherit from child objects. When Nexpert cannot establish a value within itself, it asks the user for the answer. Order of Sources ceases to be active when Nexpert finds an answer.

Nexpert's default question reads something like "What is the value of ...". With the meta-slot prompt line, you can write questions that give your query more precision. Using the @V function in the prompt, you can add variables to the question for clarity. The ability to add values in the prompt line, also found in Level5/Macintosh, is an important interface-design tool for portability. Both Nexpert and Level5/Macintosh run on several platforms, and custom interfaces are often too costly to develop. By using values from the knowledge base in question, you are able to create a more-custom-looking delivery environment.

Nexpert objects are also important links to the outside world. With their ability to call external routines and map to data-bases, they can bridge the information available in



TextPert™ Reader.

We've got a new concept in Optical Character Recognition for the Mac. It's called TextPert. We'll show you five good reasons that make TextPert the most intelligent OCR purchase you can make.

1 Flexibility

Flexibility in the type of document you want to read—(TextPert can read documents as simple as mono-spaced, typewritten pages or as complex as newspapers and telephone directories). Flexibility to read any text - bold, italic, written in a foreign language with special characters, or written in an unusual font. Flexibility in choosing the scanner you want to use or turning the scanner you already have into an Expert TextReader—(we work with all Macintosh compatible scanners on the market).



2 Ability

Ability to read columns of kerned text from 4 to 36 points in size printed on poor quality paper. Ability to read columns or tables of information, maintain their format, and import them into databases. Ability to read text even if it has up to a 25% rotation.

3 Compatibility

TextPert is compatible with you. It is intuitively written to modify the reading parameters automatically according to the document it is reading. And it is compatible with all of the major word-processing and page layout programs available on the Macintosh.

4 Affordability

TextPert gives you the power and functionality of large OCR systems at a fraction of the price.

5 It Works

Unlike other programs which claim to give you large system functionality at a fraction of the price, TextPert works... with an error rate of less than 1/2% on high quality originals.

CTA

CTA, Inc.
747 Third Avenue, 3rd Floor
New York, New York 10017
Tel: (212) 935-2280
Fax: (212) 935-2272

Available through:
Softsel Computer Products
Eastern U.S. (800) 645-7779
Central U.S. (800) 645-7775
Western U.S. (800) 645-7778

or:
(Tri-State Area)
Beta Business Products
Tel: (212) 725-8333
Fax: (212) 779-0567

In Canada:
Uppercase Technology Inc.
P.O. Box 3280
Markham Industrial Park
Markham, Ontario L3R 6X6

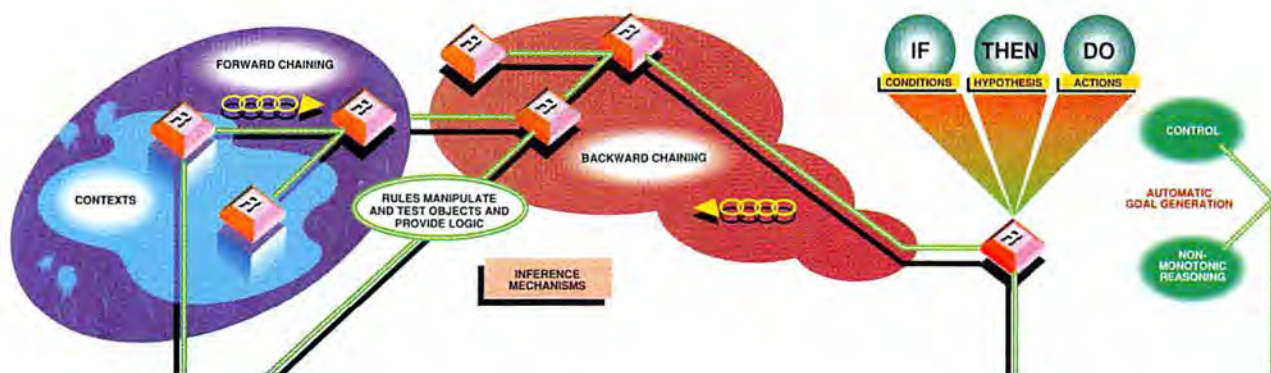


TextPert™

Expert Text Reader

TextPert reads quickly and accurately, with maximum flexibility, and at an affordable price. Call us at 1-800-252-1442 for more information, or 212-935-2280 in New York State. In Canada, call 1-800-DTP-4244

The Expert Is In



common applications such as AEC Information Manager, Excel, File-Maker II, and Double Helix. When the selected information is read into Nexpert, each record becomes a dynamic object that inherits properties from a class. If you were retrieving a table description from a database of interior design, you would map database fields to object properties. Meta-slots from the class are also inherited by the dynamic objects. Nexpert turns information about real-world objects into dynamic representations that act not only as repositories but also as changing and reasoning entities.

Much of Nexpert's power comes from its ability to create and interact with dynamic objects. Dynamic objects differ from static objects in that they disappear when you restart an inference; static objects are a fixed part of your knowledge base that you must delete to remove. By capitalizing on Nexpert's facility with dynamic objects, you can create virtual factories in which parts interact and combine to become assemblies, schedules change because an object is not available, and random failure is introduced by rules to add shadows to the idyllic silicon and electronic workplace.

Ruling the Roost

We spend our entire lives trying to break rules, but rules are what we learn in school and on the job, and they're the knowledge we pass on to others. A virtual factory can be

thought of as a set of things in an actual factory that are controlled by rules that govern how they behave. Processes and logic in Nexpert Object are built with rules. Rules in most expert-system shells are composed of English words arranged in IF/THEN statements. Nexpert Object augments the IF/THEN rule with the IF/THEN/DO format, which allows Nexpert to incorporate many complex structures such as rule-modified inferencing and creation of new object collections.

Nexpert's rules are a bundle of objects categorized as conditional statements, a hypothesis, and actions, all displayed in the rule editor (see Figure 4). Its rules also contain various control fields that help resolve conflicts between two rules that otherwise seem equally valid. On the left-hand side (LHS) of the rule editor are the conditions, the set of items that must be satisfied before a hypothesis is true. If a hypothesis is true, Nexpert processes the right-hand side (RHS) of the rule, or actions. Here is an example of a rule:

```
IF
YES   The_sky_is_cloudy and
NO    I_do_not_possess_
      an_umbrella

THEN  I_should_have_
      an_umbrella

EXECUTE Robotic_umbrella_
       bringer_routine
```

The YES and NO statements are

Boolean conditions, the THEN statement is the hypothesis, and the EXECUTE statement is an action. The Nexpert Object language is rich and diverse. All the terms are easily accessible through pop-up windows. It is impossible to forget what reserved words are available, but their syntax is a bit tricky.

Conditional statements can use 1 of 19 reserved words to compare what the expert system is told against what it is looking for. Boolean YES and NO test black-and-white answers. Since a hypothesis is a Boolean object, YES and NO are very important in structuring a knowledge base.

A hypothesis in a condition of a rule forces Nexpert to backward-chain to the referenced rule and prove it before proceeding. This type of linkage is called a *strong link*. Nexpert rules can also be weakly linked through a Context. The Context lists a group of hypotheses that the system must examine before ending a consultation, even if the hypotheses do not have anything in common. Contexts can be used to group loosely organized items such as a series of checklists.

The symbols >, <, <>, =, >=, and <= test numeric values. Numeric values in Nexpert can be numbers entered by a user or can be calculations performed within the rules. Equal and NotEqual are for comparing variables with each other. If Door.color and Frame.color both have the value *blue*, they are equal. IS and ISNOT test for string variables or

642 MB - 5.4 ms Access

The Fastest Data Storage Products Available

- 20 MB to 1.01 GB - Internal and External Systems - to 5.4 ms
- Synchronous NuBus Host Adapter - 4 MB/Second Transfer
- 60, 150 and 320 MB Streaming Tape Backup Systems
- 45 MB Removable Cartridge Hard Disks - 25 ms
- Multiple Partitions With Password Security
- AppleTalk and A/UX Compatible

**New Ilcx
Internal and
External Systems**

105, 173, 282,
303 and 404 MB
15 to 18 ms



"QUALITY YOU CAN COUNT ON"
Call for data sheets and the name of your
nearest dealer. Dealer inquiries invited.

Macintosh, AppleTalk and A/UX are registered
trademarks of Apple Computer, Inc.



Manufactured By:

MicroNet Technology, Inc.

20 Mason • Irvine, California 92718
Tel: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: D1656 • CompuServe: 76004,1611

Distributed By:

CAL-ABCO

6041 Varrel Avenue • Woodland Hills, CA 91367
Sales: (800) 669-2226 or (818) 704-9100 ext. 311
FAX: (818) 704-7733 • Canada: (800) 387-4345

Please circle 143 on reader service card.

The screenshot shows the 'RULE EDITOR' window in the 'INTELLICHECK' application. The window has a menu bar with 'File', 'Edit', 'Expert', 'Encyclopedia', 'Inspector', 'Report', and 'Windows'. Below the menu is a toolbar with buttons for 'Modify', 'Find', 'View', 'OK', 'Cancel', 'Check', and 'Quit'. On the left side, there is a sidebar with a tree view where 'Learn' is selected. The main workspace is divided into two panes. The left pane contains a table with two columns: 'iSCSI_Devices' and 'SCSI'. The 'SCSI' column has the value '1'. An arrow points from this table to the right pane. The right pane has a title bar 'Actions' and contains a table with three columns: 'Do', 'LENGTH(iSCSI_Device)', and 'number'. Below these tables are several input fields: 'Reference Category' (with a dropdown set to '1'), 'Category Atom', 'Comments', and 'Why'. On the far right, there is a vertical toolbar with icons for various actions like 'add', 'edit', 'delete', 'copy', 'paste', etc.

keywords. You can use IS to test IS TODAY "Tuesday." IS and ISNOT can also test internal values of Nexpert, such as the state of a hypothesis.

Manipulating lists is very important in AI applications and makes Nexpert an excellent database front

Name and Show are not tests but assignment operators. Name sets a variable to a given value, and Show displays a text file or PICT or MacPaint picture to help the user through the question. Name is also for passing messages between objects. An action such as Name Door.color Frame.color passes the current value of

The final part of a rule is called an *action*. Actions can perform 12 functions. With actions, you can assign variable values with DO and LET. You can reset rules and other Nexpert elements. Resetting, for example, is used to make Nexpert forget that it knew something. When the weather changes from sunny to rainy, you might reset items in a traffic-control expert system such as *number of in-*

COMPUTEREYES™



Capture Video Images: \$249.95!

Capture real-world images on your Mac 512E, Mac Plus, SE, or Mac II from any standard video source (video camera, VCR).

On the screen...

ComputerEyes includes several options for images display, and edit options such as shrink, expand, scroll, and more.

Behind the scenes...

ComputerEyes acquires larger-than-screen images with 256 gray levels for desktop publishing and image processing

On paper...

ComputerEyes saves images on disk in several file formats including TIFF, MacPaint, PICT, RIFF, and EPS for use with PageMaker, Hypercard, MacPaint — virtually all the popular graphics programs.

Think of the possibilities!

ComputerEyes is backed by a one year warranty and the success of over 20,000 systems sold. See your dealer or order direct. For more information, example images, or Demo Disk (\$3), call (617) 329-5400.

To order call 800-346-0090
VISA, M/C, COD accepted.
Digital Vision Inc.
66 Eastern Ave.
Dedham, MA 02026

**DIGITAL
VISION**

Now you can back up
without slowing down.

No other backup program works as efficiently. A single backup makes a complete record of your files. Then, only new or modified files are copied. Old versions are deleted. So you won't waste space storing outdated versions.

And, files are backed up in Finder-readable format, so you can access them



directly off a wide range of backup media. Floppies, tape, cartridges, other hard disks. Even the new Apple®FDHD™ high-density floppy drives.

Also available—
Network DiskFit.™ To back
up AppleShare® and TOPS®
networks. See DiskFit and
Network DiskFit now, at
your SuperMac™ software
reseller.

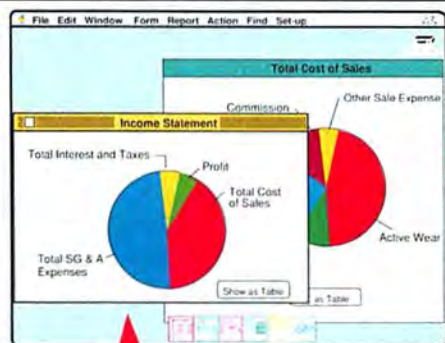
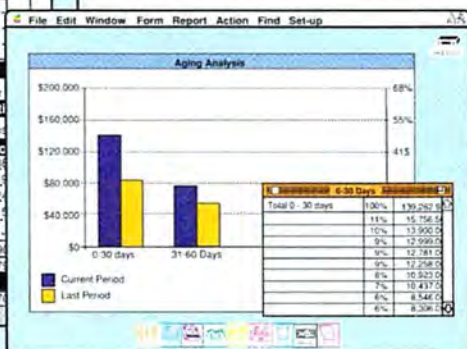
The first. And still champion.



485 Potrero Avenue • Sunnyvale, CA 94086
408 • 245 • 2202 (Dept. 300)

© 1989 SuperMac Technology. All Rights Reserved.
SuperMac, DiskFit and Network DiskFit are trademarks of SuperMac Technology. Apple and AppleShare are registered trademarks, and FDHD is a trademark of Apple Computer, Inc. All other brands and product names are trademarks of their respective holders.

Users and Critics Agree... **INSIGHT is #1**

**Payroll
Now
Available!**

Every time INSIGHT wins another award, or tops all others in a comparative review, our users are the real winners. With each success we increase our dedication to improving and expanding our product line. Experts say that the INSIGHT Accounting Series is the best modular accounting solution on Macintosh today... and thousands of users agree.



Call for more information and your Payroll Hypercard Demo disk (\$9.95 plus shipping & handling).

1-800-622-4436

- ★ **MacWorld** World Class Award '87, '88, '89
- ★ **MacGuide** May '89 winner over Great Plains
- ★ **Mac Buyer's Guide** Spring '89 winner over Flexware
- ★ **Computer Currents** October '88 choice over Great Plains
- ★ **Software Digest** 1988 rated #1 Mac Accounting
- ★ **MacUser** Editors' Choice Award '86
"Best New Business Accounting Software"



LAYERED INC.™
The First Family in Macintosh Accounting

529 Main Street • Boston, MA 02129
617-242-7700 • Applelink:D0254 • Macnet: Layered

Demo requires Hypercard 1.2.1 or higher. Hypercard is a trademark of Apple Computer, Inc. Macintosh is a trademark of Apple Computer, Inc. Insight is a registered trademark of Layered, Inc.

Please circle 106 on reader service card.



tersection patrol persons and issue raincoats. Create and Delete Object are used in Nexpert to create new groups of objects or to delete objects that are no longer useful. If pattern matching has honed down a list of eligible cars for a purchaser, Create Object can be used to link that list to a new class called eligible_cars. The Execute operator calls external routines that enhance the data-processing capabilities of Nexpert. Show displays PICT and MacPaint graphics. Retrieve and Write are used in database functions.

The LoadKB (where KB stands for knowledge base) and UnloadKB operators are for dynamic management of knowledge bases. After your initial session with an accountant, the accountant's expert system might unload its preliminary knowl-

Nexpert Object is racing toward the convergence of hypertext, databases, and intelligent assistants.

edge base and load either the long-form or short-form knowledge base. Knowledge-base loading and unloading is an excellent opportunity to use Nexpert's interpreted statements. When you put backslashes around an object, the object becomes generic. An interpreted statement such as \filename\ can be set with LET to the name 1040short or 1040long. This way the same rule

can be used for both conditions.

Nexpert's rule language is full of intricacies and possibilities. It is not something you will master over a cup of coffee and a doughnut. But once you've mastered it, you can transform your Macintosh into a reasoning machine. Level5 offers simple rules with mathematical capabilities, but Nexpert's interplay of objects and rules offers infinitely more possibilities than Level5 does. And although OPS5 is blessed with excellent pattern-matching skills, its arcane LISP-based architecture and difficult-to-master syntax make it undesirable unless you are willing to make consultants a permanent fixture of your operation. With patience, most computer-literate people will easily acclimate to the Nexpert Object rule-editing environment, with

MathType 2.0

Equations for Word Processing

Create publication-quality results like this by using MathType 2.0 with your word processor or desktop publishing program:

$$\left\{ \int_a^b \left(\sum_{i=1}^m \lambda_i(x) \right)^p dx \right\}^{\frac{1}{p}} \leq \sum_{i=1}^m \left\{ \int_a^b [\lambda_i(x)]^p dx \right\}^{\frac{1}{p}}$$

Unlike most other equation editors, MathType 2.0 automatically applies the spacing and formatting rules used by professional math typesetters as you build an equation using simple point-and-click editing. When used with LaserWriters and imagesetters, equations are output directly into PostScript, giving unprecedented quality and typographic control. MathType 2.0 runs as a desk accessory and features a new, customizable user interface and keyboard access to all functions. MathType 2.0 also includes a PostScript font containing characters used frequently in math and science but unavailable in standard fonts.

Let us show you how MathType 2.0 has set a new standard in equation editing. Ask for our brochure and **free demonstration disk** including mini-tutorial. MathType's suggested retail price is still only \$149.



See us at the
MacWorld Expo

6475-B E. Pacific Coast Hwy., Suite 392, Long Beach, CA 90803 • (213) 433-0685

Please circle 53 on reader service card.

Work in harmony with your printer.

SuperLaserSpool™—our best-selling printing control software—lets you work and print at the same time.

Automatically. Regardless of how long or detailed your documents. Or how many.

SuperLaserSpool lets you send multiple jobs to the printer. Reassign the order in which they'll print. And determine if jobs have printed. You can even preview jobs. And zoom in on any part of a page for a close-up view.

SuperLaserSpool is the industry standard. No other

spooler offers so many control features. Works faster. Or more easily.

SuperLaserSpool works with virtually all Macintosh® software, including PageMaker®. And it supports all Apple® compatible printers.

Plus there's the new SuperLaserSpool Five-Pack. And SuperSpool™ exclusively for ImageWriter® printers.

Whichever you choose, you'll see a big jump in your productivity. See them now at your SuperMac® software reseller.



The first. And still champion.



485 Potrero Avenue • Sunnyvale, CA 94086
408 • 245 • 2202 (Dept. 300)

© 1989 SuperMac Technology. SuperMac, SuperLaserSpool and SuperSpool are trademarks of SuperMac Technology. Apple, Macintosh and ImageWriter are registered trademarks of Apple Computer, Inc. All other brands and product names are trademarks of their respective holders.

Introducing The Ideal Medium For Your Imagination.

TEXT—Easily create or modify, and produce special effects.

GRAPHICS—Import or create with built-in color paint and draw tools.

ANIMATION—Quickly and easily create animations and effects.

MUSIC & SOUND—Input and synchronize any Mac sounds.

VIDEO IMAGES—Incorporate images from any source.



Presenting MacroMind Director

Need more punch in your presentations? Got an abstract concept that's difficult for people to grasp? Now there's a new medium that lets you communicate with far greater impact than ever before pos-

sible. And you can do it right on your desktop—with MacroMind Director. The first Macintosh tool that lets you create, control and integrate text, graphics, animation, audio, and video images into dynamic multimedia presentations.

Now you can electrify boardrooms, enliven sales conferences, and perk up product training—with stunning multimedia presentations that leave slides and overheads in the dust. You can construct simulations and prototypes to help people visualize concepts. Or put anything you create onto videotape. Even add special effects to existing videos. And you can do all this quickly—with

complete creative control, and at a fraction of traditional costs.

MacroMind Director is a highly evolved successor to VideoWorks II, enhanced with over 100 new and sophisticated features. Call us at 415-442-0200, ext. 55 for upgrade information, or call for the \$9.95 demo disk.

Or just ask for MacroMind Director at your dealer today. And introduce yourself to the first medium that can truly capture your imagination.



Create multimedia simulations to help people grasp abstract or complex concepts.



Multimedia turns reports and proposals into scintillating presentations.

Copyright © 1989 MacroMind, Inc. All rights reserved. MacroMind and MacroMind Director are registered trademarks of MacroMind, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

Please circle 39 on reader service card.

MacKNOWLEDGE™



MacKNOWLEDGE™

An Information Gateway

Macintosh
Communications
Software



PROMETHEUS
Communications products from a communications company



FIRST TIME?

For the first time (or even expert) communications user, the experience of using a modem or logging onto a service can be, frankly, quite trying. Until you try MacKNOWLEDGE™ - created to give you all the power of your Mac without compromising the interface.

Speaking of interfaces, you can create custom information interfaces with TAL. TAL, our next generation scripting language, allows you or your users timely, accurate and effortless access to information. And that's as important as the information itself.

We start you off with immediate access to BIX, CompuServe, Delphi, Dow Jones, MCI Mail and The Source as well as the ability for MacKNOWLEDGE to "learn" to access any system.

By the way, if you're looking for a modem for your Macintosh, inside or out, 2400 to 9600 BPS, ProModems come ready to use with MacKNOWLEDGE and, if necessary, the cable included.

PROMETHEUS®
Communications products from a communications company

7225 SW Bonita Rd, Tigard, OR 97223
(503) 624-0571 FAX (503) 624-0843

Resellers - Prometheus Products are proudly distributed by Micro D and Bonsu

Please circle 188 on reader service card.

Macintosh Expert-System Shells

OPSS is the classic LISP-based expert system that is more programming language than environment. OPSS was the development language for Digital Equipment's XCON, XSEL, and Dispatcher expert systems. The basic algorithm was developed by Charles Forgy at Carnegie-Mellon University. OPSS is a forward-chaining expert system with excellent pattern-matching capabilities. Versions on the Macintosh are available from Expertelligence (ExperLisp, ExperCommon Lisp, and ExperCommon Lisp II). Expertelligence, 5638 Hollister Ave., Third Floor, Goleta, CA 93117; (805) 967-1797. ExperLisp, \$495; ExperCommon Lisp, \$995; ExperCommon Lisp II, \$1,195.

Cognate This \$250 set of libraries from Peridom puts the pattern-matching power of OPSS into your applications. Cognate, based on NASA's CLIPS expert-system shell, is also available as a stand-alone product for \$150, but its real potential lies in embedding the libraries in your own code. Cognate has few editing capabilities, and its rules are entered through text files, but it is fast and efficient during execution. The syntax of rules, based on LISP, can be difficult for users not versed in OPSS and LISP. If you are an ART, KEE, or Knowledge Craft user looking for an inexpensive shell, Cognate is a good delivery tool. Peridom, Inc., P.O. Box 1812, Bowie, MD 20716; (301) 390-9570. Stand-alone version, \$150; developers' version, \$250.

ExperFacts LISP expert systems for less than \$10,000 are hard to find, but if you own ExperLisp from Expertelligence, \$495 will bring you an adequate expert system to learn with. The strengths of ExperFacts revolve around its tight integration with the Macintosh Toolbox. LISP functions can interact with ExperFacts' forward-chaining rules to give you some interesting programming possibilities. ExperLisp and ExperFacts are aging Macintosh 512K programs, however, that have a hard time competing with newer, more-extensive products. Expertelligence, 5638 Hollister Ave., Third Floor, Goleta, CA 93117; (805) 967-1797. \$495.

Flex, from Programming Logic Systems, is a Prolog-based expert-system shell. Flex has a full frame-description language and accommodates both forward- and backward-chaining techniques. The control structure for Flex can be a little confusing, and the manual's poor layout doesn't help. But once you've mastered it, Flex is a powerful expert-system-development environment. Programming Logic Systems, Inc., 31 Crescent Drive, Milford CT 06460; (203) 877-7988. \$495.

Humble Xerox PARC and its Smalltalk language first breathed life into the menus, windows, and bit-map editors that evolved into the Macintosh. Humble, an expert-system shell written entirely in Smalltalk, uses rules and objects to create complex expert-system applications. Although Humble is a well-designed system, it is mainly for Smalltalk developers who need to integrate intelligence with their applications. I like Humble, but if Smalltalk is not your bag, look at another shell with a learning curve that does not include a complete language with new concepts and constructs. Xerox Special Information Systems, 250 N. Halstead, P.O. Box 7018, Pasadena, CA 91107; (818) 351-2351. \$395. Requires the \$995 Smalltalk language from ParcPlace Systems.

HyperX If you have ever wanted to play with artificial intelligence and expert systems, HyperX is an ideal place to start. The new 3.0 version of the product incorporates many of the characteristics of

expensive AI products, at a fraction of their cost. Astute students will find forward and backward chaining, demons, and object-value pairs. Object-value pairs are a bit more sophisticated than simple English sentences and make HyperX a more expressive system. Unlike the functions and editors of Intelligent Developer, which uses an external program for knowledge-base development, all of HyperX's functions and editors are written completely in HyperCard's HyperTalk. Millennium Software, 1970 S. Coast Highway, Laguna Beach, CA 92651; (714) 497-7439. \$99.95.

Instant-Expert and Instant-Expert Plus

With Instant-Expert 2.0, the low end of Human Intellect's program has matured to include an excellent editing environment that retains the old version's simplicity and understandability. With Instant-Expert Plus, developers will find much power lurking in its 79 commands. Instant-Expert Plus is very good for report-writing expert systems. Its text-file-handling capabilities are unsurpassed on any of the Mac shells. At \$49.95,

Instant-Expert is a steal, and the \$495 price of Instant-Expert Plus makes it very competitive with products such as Level5/Macintosh. Human Intellect Systems, 1670 S. Amphlett Blvd., Suite 326, San Mateo, CA 94402; (415) 571-5939. \$49.95 for Instant-Expert. \$495 for Instant-Expert Plus.

Intelligent Developer was originally designed as a stand-alone expert-system shell with limited distribution rights for its nondevelopment version, but then came HyperCard, and Intelligent Developer added some pizzazz. The \$395 price of Intelligent Developer includes the original software and a HyperCard delivery environment that supports all Intelligent Developer functions except its built-in database. Once you're in the HyperCard environment, animation and sounds can make a boring knowledge consultation intriguing. For real knowledge-engineering types, the debugging and reporting capabilities of ID are hard to surpass. Hyperpress Publishing Corp., P.O. Box 8243, Foster City, CA 94404; (415) 345-4620. \$395.

Level5/Macintosh. For PC developers whose users have joined the Macintosh ranks and refuse to look at DOS prompts, Level5/Macintosh makes a great delivery tool. None of the work done on the PC is lost in the translation, but nothing is gained either. Level5/Macintosh knowledge bases are entered in a very plain text editor. To catch errors or run a consultation, you must compile Level5's Pascal-like rules. Errors return you to the text editor, but you get only minimal guidance. Graphics, including 256-color Mac II drawings, can be displayed, but they must be closed before their associated questions can be answered. Level5 2.0 on the PC will be delivered in Windows. When this new interface is ported to the Mac, the product will benefit from a much-needed face-lift. Information Builders, Inc., 1250 Broadway, New York, NY 10001; (212) 736-4433. \$695.

MacSmarts is a simple expert system that allows entry of rules through a spreadsheetlike environment. MacSmarts can handle only simple text strings, lacking variables or calculations. MacSmarts' main attribute is its easy-to-implement hypergraphics interface. The program is ideal for an entry-level system to automate help-desk functions. MacSmarts Professional, which should be shipping as you read this, adds variables and calculations to the standard MacSmarts fare. Cognition Technology, 55 Wheeler St., Cambridge, MA 02138; (617) 492-0246. \$195.



Introducing ColorPage™

- Perfectly flat screen
- Actual size 72 dpi
- Full page view
- Low cost



More Color for Your Money.

More Color

ColorPage™, E-Machines' newest color display, gives you more room. A full page of room. A third more than the Apple 13". At exactly 72 dpi, the same size as your printed page or presentation slide.

More Value

E-Machines ColorPage gives you sharp, colorful, actual size full pages. All at a price/performance that beats the Apple 13".

More Features

Only Color Page has a perfectly flat, flicker-free screen, 256 vivid colors, tilt/swivel base and unique software to enhance viewing. And, we back our displays with MoreCare™ for the best in quality, warranty and support.

More Innovation

Any way you look at it, E-Machines innovative display systems give you more color for your money.

Find out where to buy an E-Machines ColorPage. Call us today at 503-646-6699. Or, write to us at 9305 SW Gemini Drive, Beaverton, OR 97005.

Please circle 20 on reader service card.

ColorPage™ - Full
page 768 X 576.
Apple 13" - 3/4 page
640 X 480.



E-MACHINES
Power to See Your Best

© 1989 E-Machines. ColorPage and E-Machines are trademarks of E-Machines, Inc.

Executive Summary

If you can afford Nexpert Object, its list of features makes it the ideal tool. But when cost is a factor, a lesser shell must be chosen. For many diagnostic and personal-assistance applications, any of the established products are solid buys. If you have to embed your expert system in an application, however, Nexpert and Cognate are your only choices. For easy custom interfaces, Instant-Expert Plus and its "hot spot" graphics can't be beat.

The bottom line is to buy the best shell you can afford. Although an expert system such as Nexpert may seem overwhelming at first, you'll soon outgrow a simple product such as MacSmarts as your projects get more complex.

its visual webs and watchful debugging tools.

At the Frontiers of Knowledge


Although Nexpert is an excellent companion for knowledge engineering, it is not without deficiencies: My training required the excellent classes of the Bechtel AI Institute, contracted by Neuron Data. Nexpert is an involved product to learn, and its manual is a complex document to read. Now that I know the basics, I use the manual as a reference for its finer points. New users, however, can lose their way quickly in its maze of cross-references and allusions.

Nexpert is a relatively complete knowledge-engineering tool, but certain technical elements, such as multivalued variables and true intelligent objects, are missing. There are annoyances such as the inability to cut and paste between fields because some other platforms, such as UNIX workstations, can't handle this function. Nexpert also has a frustrating copy-protection scheme that won't let you make archival copies. To install Nexpert, you execute the floppy-disk version and install it on your hard-disk drive, but if you lose

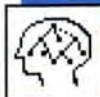
your hard-disk drive and get another, you can't use the floppy disk to reinstall the software. On the PC, Neuron Data uses security hardware that is equally aggravating.

But these flaws are minor compared with the usefulness of the tool. The development environment of Nexpert is an excellent example of what Macintosh applications need to evolve into. Notebooks that hold data, objects, classes, or rules can, with a single click of the mouse, become editors. Sprawling overviews of your knowledge base or object representation can be focused for clarity or expanded for context. Clicking on almost anything in Nexpert reveals a pop-up menu that simplifies data entry or eliminates the time-consuming shuffling of windows.

Nexpert Object is an elegant product for developing knowledge-based software. Occasional users will complain of complexity when returning to Nexpert after an absence, be-

cause it's a tool that must be used constantly and consistently to be learned well. Nexpert Object is a program racing toward the convergence of hypertext, databases, and intelligent assistants. Future versions of Nexpert will incorporate more features, such as direct links to Oracle and HyperCard. An upcoming module, Nextra, will add a powerful tool for knowledge acquisition. And with the release of the Open Interface Toolbox (OIT), on which Nexpert is built and which enables Nexpert's well-known portability, Nexpert users and software engineers alike will benefit from OIT's machine-independent resources. When that happens, Nexpert will be a key link in the Mac's ability to adapt to the future, where data and information are transformed into knowledge. 

Dan Rasmus is manager of Computer Assisted Manufacturing at Western Digital. He also frequently writes and lectures on the Macintosh and artificial intelligence.



Nexpert Object

★★★★½

Follows Macintosh Interface	5
Printed Documentation	3 1/2
On-Screen Help	1
Performance	5
Consumer Value	4 1/2

Comments: An excellent C-based expert system for the Macintosh. Nexpert has proven itself in several extensive real-world systems. The graphic editing environment improves on the standard Mac interface. **Best Features:** Quickly mastered entry of rules and objects. The program lets you learn the language and concepts without bogging you down with operation issues. The ability to port knowledge bases to other machines without rewriting is a strong plus. **Worst Features:** The copy-protection scheme makes backing up the software

impossible. It must be removed before you can run a disk-optimization program. Lack of Cut and Copy commands within editors is also annoying. **List Price:** Nexpert Object, \$5,000; Nexpert Object under A/UX, \$6,500; run-time version, \$750; run-time version under A/UX, \$1,000; AI/Version Interface Builder, \$500; one-year upgrade, \$1,000; one-year upgrade to A/UX version, \$1,200; Nextra, \$4,000. (Discounts are available to volume customers.) **Published by** Neuron Data Corp., 444 High St., Palo Alto, CA 94301; (415) 321-4488. **Requires** Macintosh Plus, SE, or II and 1 megabyte of RAM. Best if used with a hard-disk drive and color monitor. Works with the Mac IIx, A/UX, and MultiFinder (requires a 1,200K-to-1,500K partition). Takes up 686K. Version 1.1 reviewed. Only one copy can be installed from a disk.

Any way you look at it... E-Machines still gives you more.



Monochrome

More Choice

E-Machines™ gives you more with a Complete Family of monochrome, gray scale, color. Even stereo 3D displays. More choices in full page screen sizes. More compatibility with all Mac models.

More Features

Only E-Machines gives you QuickView™, special features that let your Mac do more. Features like definable virtual screens with panning, multiple viewing resolutions, tracking menus, virtual screen previewing, software controls for brightness and contrast, plug-in memory upgrades for more room and more image definition.

MoreCare™

E-Machines leads the industry

Gray Scale

in quality, warranty and support with MoreCare. By getting the details right we build in quality. And, we back our display systems with unsurpassed service, a full year warranty and the industry's best available extended warranty.

More Innovation

Look to E-Machines when you want more innovative display power than you can get from Apple, or anywhere else.

Find out where to buy an E-Machines display. Call us today at 503-646-6699. Or, write to us at 9305 SW Gemini Drive, Beaverton, OR 97005. Please circle 18 on reader service card.



E-MACHINES

Power to See Your Best

FONTGRAPHER

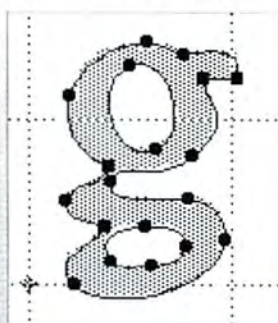
NEW! VERSION 3.0

Create Professional
Type and Logos
In Minutes!

Complete Character Sets

AaBbCcDdEeFfGg
HhIiJjKkLlMmNn
OoPpQqRrSsTtUu
VvWwXxYyZz123

Auto-trace



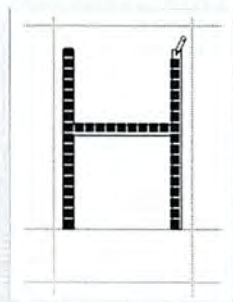
Automatic PostScript Hints

ABCDEFGHIJKLMN
ABCDEFGHIJKLMN
ABCDEFGHIJKLMN
ABCDEFGHIJKLMN
ABCDEFGHIJKLMN
ABCDEFGHIJKLMN
ABCDEFGHIJKLMN
ABCDEFGHIJKLMN

Display Fonts

AaBbCc
to
XxYyZz

Built-in Bitmap Font Editor



Width & Kern Setting

To	
T	o
Width: 385	Width: 444
Kern: -93	Kern:

Foreign Languages

Ŕ Ŗ ŗ
あ さ ฟี

Logo & Art Design



Every character you see on this page was created using Fontographer®.

Whether you begin with a scanned image, an existing font template, or draw from scratch — it's easy to design fonts using Fontographer. Right from the start!

With tools like auto-trace, automatic hints, Bezier curves, and an integrated bitmap editor, Fontographer creates downloadable PostScript® fonts as precise as your drawings. Your character sets will then print on any PostScript printer, from the LaserWriter™ to professional typesetting machines.

Now, you can design high-quality type and logos like these. Just add imagination!

Fontographer works with the Macintosh® Plus, SE and II family of computers. For more information on Fontographer or any of the other Altsys products, contact your favorite dealer or Altsys.



Altsys Corporation
720 Avenue F, Suite 109
Plano, Texas 75074
(214) 424-4888

FENDER RENDER vs.



BUMPER-TO-BUMPER.

Whether you're designing the next generation of a product or drafting the plans for a new building, you need to keep the whole project in mind. And now you can keep it in view as well, thanks to the Truevision HR Graphics card. The HR card lets your Mac® II display a sharp 1280 x 960 pixel image, 400% more than a standard Apple® monitor and 56% more than other 'high resolution' 1024 x 768 displays. Its 256 colors (from a 16.7 million color palette)

give you tremendous flexibility for engineering drawings, scientific visualizations, or 3D modeling for prototypes. And the HR supports a virtual desktop up to 2048 x 2048 pixels, allowing you to pan over large drawings in real-time, horizontally and vertically.

The HR card is QuickDraw™ compatible*, which means that you can run with virtually all Macintosh® software. And you may select the monitor of your choice from

manufacturers like JVC, Philips and SONY®. There are two Truevision HR cards available: the HR 2M (\$3995) addresses a virtual desktop of up to 2048 x 1024 pixels, and the HR 4M (\$5995) addresses up to 2048 x 2048 pixels. Get precise images and view large format drawings with the Truevision HR Graphics card. Take a test drive soon by visiting your Authorized Truevision Reseller, or call us at **800/858-TRUE** for more information.



The HR Graphics Card works with the Macintosh II, IIfx and IIfx.



TRUEVISION®

Truevision, Inc.
7351 Shadeland Station, Indianapolis, IN 46256

Please circle 70 on reader service card.

INTERNATIONAL: Canada 416/499-9400 France 33-13-952-6253 Italy 39-2-242-4551 Switzerland 41-1-825-0949 U.K. 44-1-991-0121 West Germany 49-89-612-0010 Other International 617/229-6900. Suggested retail price is US domestic price, and is subject to change.

Unretouched screen displays of an Apple RGB monitor at 640 x 480 and an HR-compatible monitor displaying the same image at 1280 x 960 pixel resolution.

*All graphics cards with more than 1MByte of memory require 32-bit QuickDraw. QuickDraw is a trademark and Apple, Macintosh and Mac are registered trademarks of Apple Computer, Inc. SONY is a registered trademark of Sony Corporation of America. Image courtesy of Electric Image. PageMaker is a registered trademark of ALDUS Corp. AutoCAD is a registered trademark of Autodesk Inc.

Full Page Buffering

Your Assurance of Quality and Performance in Imagesetting

When you see this seal on Varityper® imagesetters, it's your assurance that the equipment you're buying has been engineered with a distinct advantage . . . Full Page Buffering™. This feature, which allows a full page to be processed and printed without interruption, provides the highest output quality and system performance. You get better quality and save time and money over systems which periodically halt printing to process more data only to then resume printing.

Full Page Buffering makes Varityper imagesetters:

#1 in Quality—Continuous imaging eliminates the problems associated with start/stop schemes and provides greater long term reliability.

#1 in Speed—Varityper has the fastest image recording systems. Full Page Buffering allows them to run without interruption. It's just that simple.

#1 in Performance—Offering the broadest line of imagesetters with Adobe's PostScript® interpreter. From the 4300P and the 4200B-P for photomedia, to the VT600W and VT600P for high resolution on plain paper, Varityper is the name to remember for imagesetting quality and performance.

Call now for details.

Toll Free:

1-800-631-8134

In N.J.: 201-887-8000, Ext. 999

Varityper

a Tegra Company

Please circle 38 on reader service card.

Varityper is a registered trademark of Varityper, Inc.
PostScript is a registered trademark of Adobe Systems, Inc.
Full Page Buffering is a trademark of Varityper, Inc.

4200B-P
1800 dpi
13.3" inches/min.
60Mb Page Buffer

4300P
1200 to 2400 dpi
20 inches/min.
91Mb Page Buffer



VT600W
600 dpi
Up to 11" x 17",
7 pages/min.

VT600P
600 dpi
Up to 8 1/2" x 14",
10 pages/min.

**Novell's NetWare moves to the Mac,
competing with AppleShare on its own turf.**

Tying the Net



When you look at a good map, rivers both great and small are depicted accordingly: The main streams are like trunks, and the tributaries feed into them like branches. With the introduction of Novell's NetWare for Macintosh, tying the Mac into the big, broad mainstream of PC networks just got more involved for PC cartographers. Using NetWare for Macintosh, Macs running AppleShare client software can now hook up to a NetWare file server and share files with PCs.

Connecting PCs to Macintoshes is not new. The point here is that now you can connect them via NetWare. NetWare, which has more than 400,000 servers worldwide (approximately 60 percent of the PC market), is a corporate favorite for multiplatform connectivity. NetWare currently supports more than 90 network adapters (including Ethernet and Token Ring), 30 network architectures, and both asynchronous and X.25 serial connections at rates up to 56 kilobits per second (Kbps).

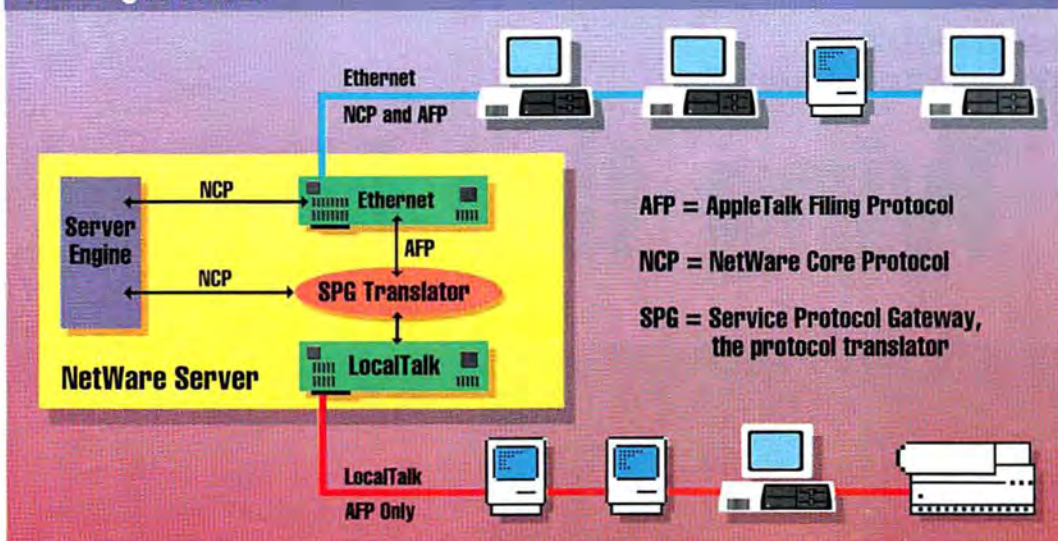
Although this is great news for corporate PC NetWare users who want to add Macs to their network, NetWare for Macintosh, in its initial release, has serious drawbacks as a server for an all-Mac network. To begin with, it's expensive: depending on the configuration, it costs \$1,595

ILLUSTRATION: RON CHAN

By Brenda McLaughlin and Stephan Somogyi

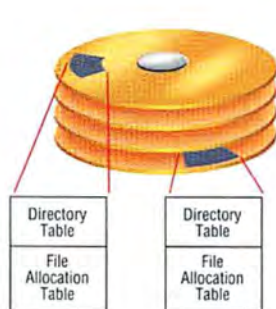
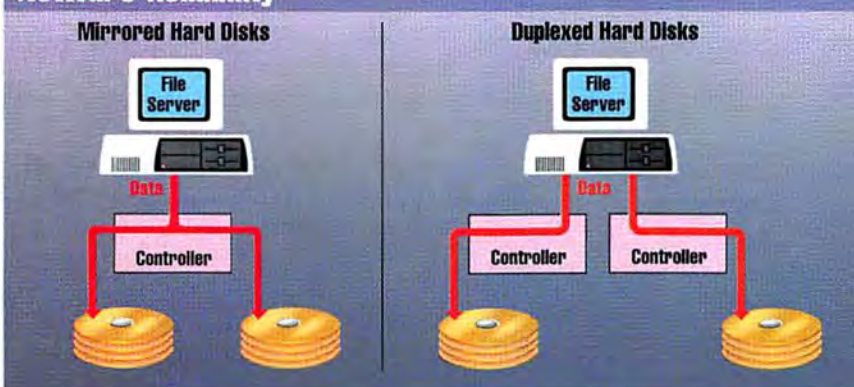
Tying the Net

Following Protocol

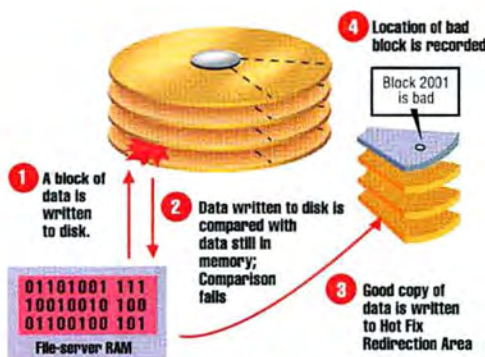


Both AFP and NCP can be sent via Ethernet; the server's Ethernet driver differentiates between the two and sends the data either directly to the server engine or to be translated first. AFP data is translated by the SPG into NCP on the way into the server. The server's response, initially in NCP, is translated back into AFP on the way back to the AFP client. Any data coming into the server over LocalTalk must be AFP and automatically goes through the SPG.

Network Reliability



Directory and Allocation Table Duplication



Read-After-Write Verification and Hot Fix

All NetWare hard disks have Hot Fix and duplicate directories to increase the durability of the file system. SFT NetWare additionally offers disk-mirroring and disk-duplexing capabilities to provide an additional degree of safety to the already reliable file system.

to \$4,895. Furthermore, with NetWare for Macintosh, you can't use a Mac as a server or as a workstation to administrate the server. You need an 80286- or 80386-based PC or compatible to act as a dedicated server — and a second PC to do network administration. Not only that, the administration PC cannot be on LocalTalk; you need to buy a pair of Ethernet cards — one for the server and one for the administration PC — just to perform management tasks. Mac users can save money by running the Entry Level System PC server in nondedicated mode, but they'll pay for it with reduced performance.

Getting NetWare Aware

NetWare for Macintosh is a "value-added process" (a software add-on to the usual NetWare software) that runs with all three levels of NetWare, version 2.15 or later. Entry Level System (ELS) Level II NetWare 286 supports up to 8 concurrent users; Advanced NetWare 286 supports up to 100; and the System Fault Tolerant (SFT) NetWare 286 configuration, the one we tested at *MacUser's* NetWorkShop, adds enhanced server

reliability to the 100-node package. Macs on LocalTalk or Ethernet (not presently Token Ring) can access a NetWare server with the NetWare for Macintosh add-on.

NetWare is a network operating system that takes over the server machine. Because a NetWare server understands only file-service requests that are made in NetWare Core Protocol (NCP), Macintosh requests made in the AppleTalk Filing Protocol (AFP) over LocalTalk or Ethernet need translating. Such AFP requests are passed to the Service Protocol Gateway (SPG), which is the key value-added process of NetWare for Macintosh. In the wonderful world of acronyms, then, the SPG translates AFP into NCP. When the server answers the request, the translation is reversed, with the SPG turning the NCP data packets back into AFP for transmission to the client Mac. This process is transparent to users, but it adds significant processing time.

NetWare lets Macs on LocalTalk share files, via NetWare, with PCs on other networks. PCs on LocalTalk — with the appropriate LocalTalk card and its PC software — can either access AppleShare servers on LocalTalk or share files with PCs on other NetWare-attached networks, again via the NetWare server. But it is important to note that PCs on non-LocalTalk networks cannot “see through” the NetWare server to access files on an AppleShare server that resides on a LocalTalk network.

NetWare and AppleShare

NetWare installation is not for the fainthearted. It is a complicated procedure and requires a good deal of expertise. Novell recommends that it be done by the NetWare reseller or a consultant familiar with NetWare, thus raising the user's costs. To install NetWare yourself, you must

generate workstation shells for individual users and install NetWare on the server PC. You must then install NetWare for Macintosh from the administration PC; this installation cannot be done over LocalTalk.

From a Mac perspective, a NetWare server looks pretty much like an AppleShare server. The only difference is that NetWare depicts MS-DOS .COM and .EXE files as Mac application icons with a DOS inset

(see Figure 1). MS-DOS data files are represented by a generic document icon (a rectangle with a folded corner), again with a DOS inset. Note, however, that DOS data files on the NetWare server cannot be launched directly from the Finder but can be loaded only from within the compatible Mac application. And DOS applications cannot be launched

from the Mac because they can't run on the Mac. On the PC side, Mac files appear on MS-DOS machines with standard DOS filenames, which contain eight characters, a period, and a three-character extension.

NetWare's printing services are also similar to AppleShare's. Mac users can either print directly, using a networked Mac-compatible printer, or they can send their documents to a NetWare print queue. Note that PC printers hooked up to a NetWare server cannot be used by Macs. However, PCs running software that supports PostScript output can print to a Macintosh printer through a NetWare print queue regardless of which network they reside on.

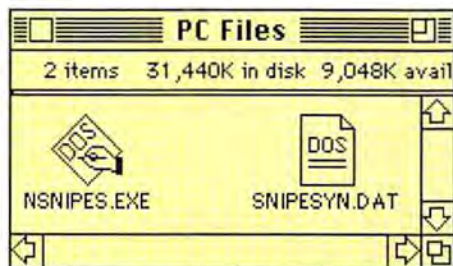


Figure 1: NetWare's support for the Mac interface differentiates between DOS applications and DOS documents.

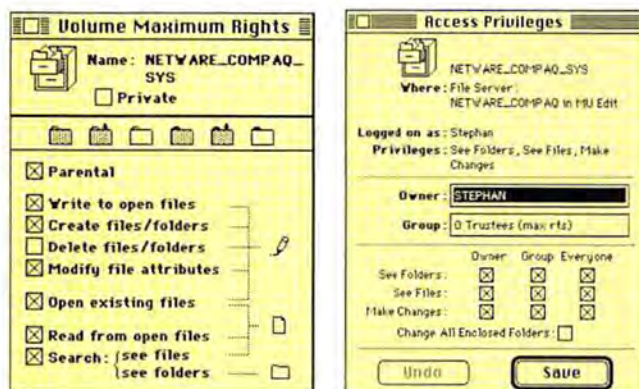


Figure 2: AppleShare's Access Privileges dialog box (right) is simple and clear. In contrast, NetWare's options (left), mapped to the Finder, can be misleading. For example, for the folder shown in this figure, the NetWare "Delete files/folders" right is disabled, so users cannot make deletions. The Finder, however, shows the "Make Changes" privilege active, making users believe they can make deletions.

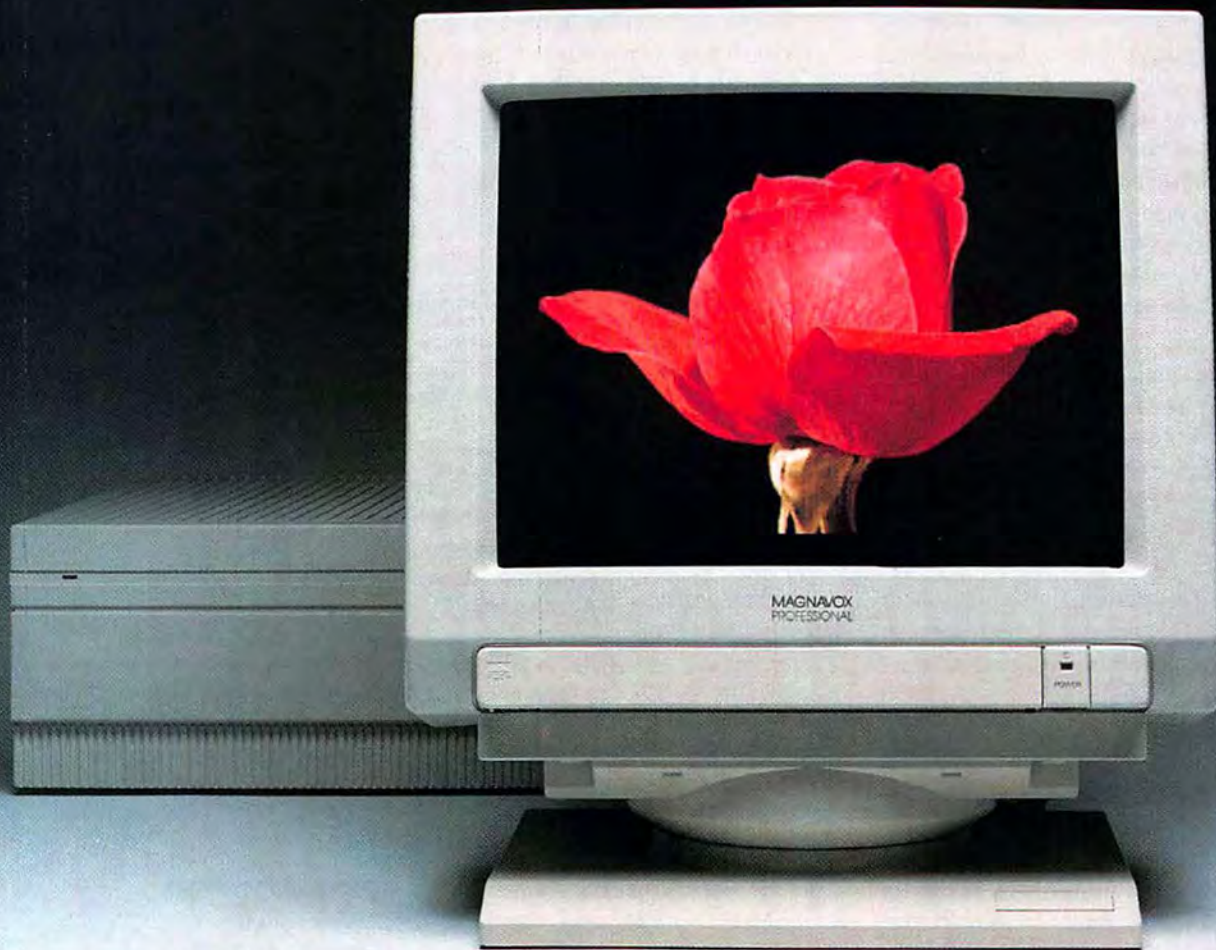
Rights and Privileges

NetWare uses a system of “rights” — similar to AppleShare privileges — to restrict access to folders on the server. You can use either NetWare's Control Center application or its NetWare DA to set these rights. The NetWare manual recommends using this NetWare software and discourages you from using the standard AppleShare software for setting privileges. In our tests, however, although the Control Center worked fine, its DA equivalent was buggy — and neither could see a NetWare server in another zone.

You do get some advantages with the NetWare rights, however. A folder on an AppleShare server can

Introducing A Better Display For The Macintosh II[®]...

For About \$300.00 Less Than You'd Expect.



This is not just another display clone. It's the new Magnavox Analog Color (MAC) display, specifically designed and engineered to compliment the Macintosh II system.

When we decided to develop a display exclusively for the Macintosh II, we started with two objectives: Make it work better, and make it cost less.

Our 14" MAC display appeals to even the most discriminating user. It's equipped with our new proprietary 0.29mm dot pitch

CRT for superb resolution, and a glossy CRT face for crystal clear images. Graphics and text on the MAC display shine at their best. The integrated tilt-base provides the ultimate in user comfort.

Additionally we offer a solid, two-year warranty instead of the usual 90 days. And the \$699 retail makes this a great value.

Designing a superior display for the Macintosh II system was smart. Offering it for \$300 less, that's very smart.

MAGNAVOX
Smart. Very smart.



Ruby Callany
import/export

Martin Waterhouse
product analyst

Val Scott
homemaker

James Hodgdon
research scientist

Chris Shedenhelm
college student

Joe Kevin Hash
writer

Gary Sparks
stock options market maker

CompuServe introduces human intelligence for your Mac.

Thousands of people just like you have put their heads together to form one of the world's most advanced data processors—CompuServe's Mac® Forums. And they'd like you to join them.

Forum members share problems and solutions on our bustling message center. They access and contribute to huge data libraries teeming with the best shareware and public domain software anywhere. And they take on the latest computing topics in live, online conferences.

Nothing can make your Mac as intelligent or as friendly as CompuServe's Forum members.

To join CompuServe, see your computer dealer. To order direct or for more information, call 800 848-8199. If you're already a member, type GO MACINTOSH at any ! prompt.

CompuServe®

Visit Us At The MacWorld Expo! Booth 1644 At Bayside.

Please circle 119 on reader service card.

Our new program can take any form you like.

If your business is like most, it relies on forms to communicate, administrate and delegate.

Yet, while the thought of replacing your labor-intensive forms system with a highly-productive forms program sounds good, the thought of replacing your existing forms probably does not.

Which is why you should think about this.

Introducing TrueForm™, the Macintosh® program that automates all of your existing forms. With TrueForm software, you don't have to change the way you work, re-train personnel or replace your current stock of pre-printed forms.

Because, unlike other forms programs, you aren't constrained by the limitations of a few built-in design tools. Instead, you can scan-in forms exactly

as they are. Or you can create new forms with your own drawing or page layout programs and easily import them into the TrueForm program.

TrueForm offers complete spreadsheet features, along with the most powerful set of data-sharing capabilities of any forms program. So you can link forms to databases, accounting applications and even computers on different platforms.

And, if you use 4th Dimension® database software,

For just \$20 (refundable when you buy the program) we'll rush you a copy of TrueForm Try-Out, so you can actually see how TrueForm performs for you.

our special interface enables you to print onto master forms without leaving that popular program.

What's more, because TrueForm is actually two programs—Set-Up and Fill-Out—you won't have to buy the entire Trueform package when you add users. Simply purchase additional Fill-Out packages whenever you need them.

But you don't have to buy either one to see what TrueForm software is all about. Just call (800) 344-8335 for our \$20 TrueForm Try-Out or visit your nearest Adobe Authorized Dealer for a demonstration.

We think you're going to like what you see.

ADOBE®



Along with one copy of the Set-Up and Fill-Out programs, you'll get templates for ten common business forms and the 4th Dimension printing module.

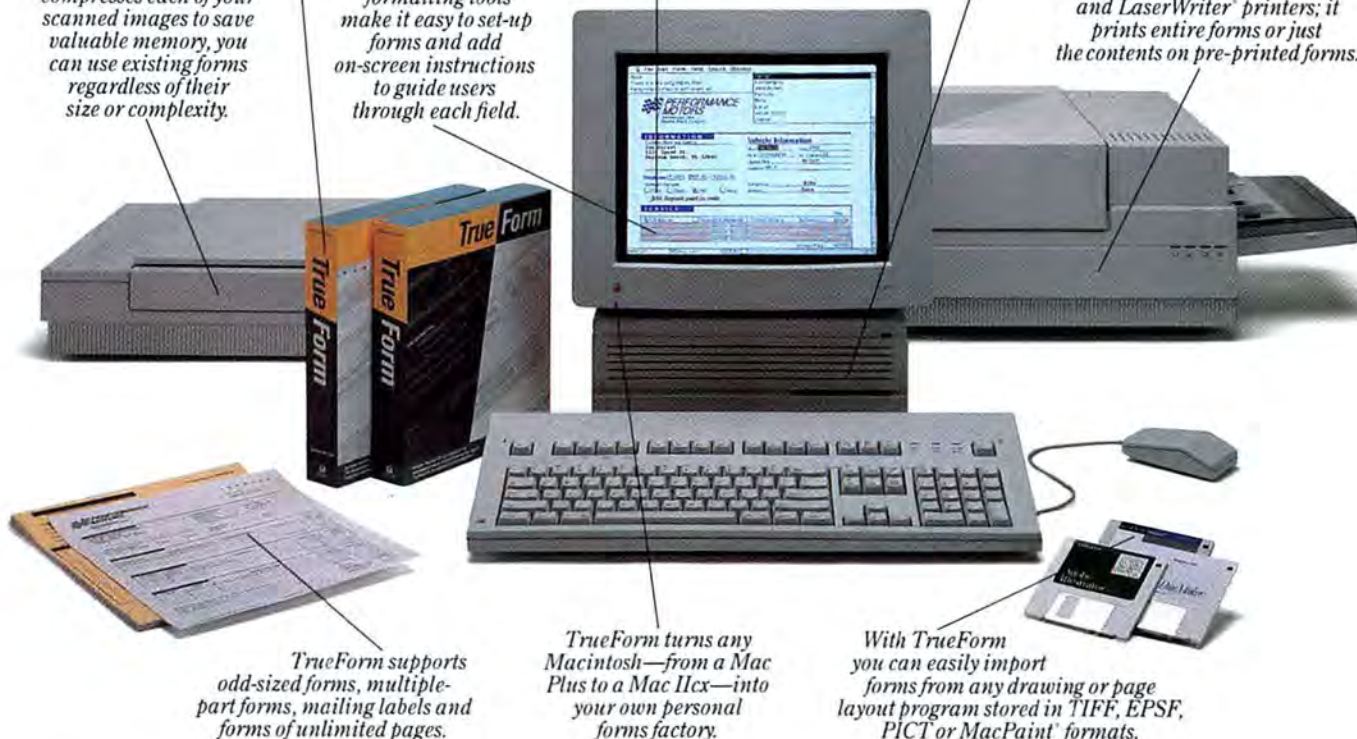
The unique QuickForm™ tool allows users to make important notes on individual forms, just as they would by hand.

TrueForm's extensive merging capabilities allow easy communication with virtually any database without modifying the data.

Because TrueForm compresses each of your scanned images to save valuable memory, you can use existing forms regardless of their size or complexity.

The program's powerful formatting tools make it easy to set-up forms and add on-screen instructions to guide users through each field.

TrueForm supports all PostScript®, as well as ImageWriter® and LaserWriter® printers; it prints entire forms or just the contents on pre-printed forms.



TrueForm supports odd-sized forms, multiple-part forms, mailing labels and forms of unlimited pages.

TrueForm turns any Macintosh—from a Mac Plus to a Mac IIcx—into your own personal forms factory.

With TrueForm you can easily import forms from any drawing or page layout program stored in TIFF, EPSF, PICT or MacPaint® formats.



Look for this symbol on computers, printers and other products that include PostScript software from Adobe Systems. It's your guarantee of quality and compatibility.

Adobe, PostScript, the Adobe logo and the PostScript logo are registered trademarks and TrueForm and QuickForm are trademarks of Adobe Systems Incorporated. Macintosh, ImageWriter and LaserWriter are registered trademarks of Apple Computer, Inc. MacPaint is a registered trademark of Claris Corporation. 4th Dimension is a registered trademark of ACIUS, Inc. and ACI. © 1989 Adobe Systems Incorporated. All rights reserved.

Tying the Net

belong to only one group and have only one set of privileges. On a NetWare server, a folder can have multiple "trustees," each with its own set of rights. NetWare offers eight definable rights as opposed to the three AppleShare privileges. Unfortunately, the NetWare DA is more difficult to use than the AppleShare DA. Furthermore, the additional rights won't be seen by users using the AppleShare DA, and they might have unexpected results when accessing folders (see Figure 2).

We found two other problems with NetWare for Macintosh version 1.0. One is the case of the disappearing server. We noticed that if the server had been up for a short period and if no users had logged in during that time, the NetWare server would disappear from the list of available servers in the Chooser. A free software upgrade that fixes this problem should be shipping by the time you read this. The other problem is the case of the drowned network. If a user was logged

on to the network but was idle for a long time, the server began to flood the network with LocalTalk packets. Novell could not determine whether this problem originated with its LocalTalk card or with the NetWare for Macintosh software and so could not say when the problem would be fixed.

Tolerating Faults

In addition to the added levels of security, NetWare offers several fault-tolerance features. All three types of NetWare use duplicate directories; directory verification on power-up to check for errors in the file system; read-after-write verification to make sure a file that was just saved is, in fact, readable; and Hot Fix, which marks defective areas on a disk found by read-after-write verification and then resaves the data on a good area of the disk.

SFT NetWare's features go even further. Added are disk mirroring, disk duplexing, and the monitoring

The DaynaNET Solution



For an all-Mac network, DaynaNET is an alternative to NetWare if you find a full version of Novell's product too

expensive and don't need all of its features. DaynaNET is a licensed version of Advanced NetWare 286 version 2.15. It doesn't include SFT NetWare's disk mirroring and duplexing, but it has all of NetWare's security and file/folder permission features. Currently, it works only on LocalTalk networks and doesn't support all the other networks and connections that Novell's product can. Future upgrades will add other AppleTalk-supporting networks.

One great advantage that DaynaNET has over NetWare is that the only PC required is the one acting as the server; you can do administration from a Mac. Also unlike NetWare, DaynaNET has a Stamper utility that maps MS-DOS file extensions to Mac applications — for example, all files ending in .WKS can be "stamped" to be Wingz or Excel spreadsheet documents.

PCs communicate with a DaynaNET server via AFP. To let them do this, you can install a DaynaTALK card, priced at \$249. Macs connect through their built-in LocalTalk hardware or through a DaynaTALK connector box that retails for \$189. DaynaTALK allows Macs to communicate at speeds of up to 850 Kbps over LocalTalk wiring versus the standard 230-Kbps speed. (See next month's Bridges for a comparison of DaynaTALK and TOPS' competing product, FlashBox.)

DaynaNET costs \$1,249, for which you get server software, a DaynaTALK card for the server, and its driver. An EtherTalk driver is scheduled as an upgrade for about \$500. Through an agreement with Novell, buyers of DaynaNET will be able to upgrade to Novell's SFT NetWare without having to buy SFT in its entirety. Pricing for the upgrade was not available at press time.

DaynaNET appears to hold great promise as an AFP server. We will have a full product review in a future issue.

Dayna Communications, Inc., 50 S. Main, Fifth Floor, Salt Lake City, UT 84144; (801) 531-0600.

— Stephan Somogyi

Costing Chart

SFT NetWare System	\$18,168
Advanced NetWare System	\$18,468
ELS Level II NetWare System, dedicated	\$14,868
ELS Level II NetWare System, non dedicated	\$10,061
DaynaNET System*	\$9,465
AppleShare System	\$7,694

- Compaq 386/20 server, mono monitor, LocalTalk card, 3MB RAM, 40MB HD = \$8,466
- Admin PC (Compaq Deskpro 286), mono monitor, 40MB HD, 2 Ethernet cards = \$4,807
- SFT NetWare 2.15 + NetWare for Macintosh = \$4,895
- Advanced NetWare 2.15 + NetWare for Macintosh = \$3,195
- ELS Level II NetWare 2.15 + NetWare for Macintosh = \$1,595
- DaynaNET (includes LocalTalk card) = \$1,249
- Macintosh SE/30, 2MB RAM, HD 40SC = \$6,895
- AppleShare server software = \$799

*DaynaNET's server doesn't need a LocalTalk card, card is included in DaynaNET price.

NetWare is not the cheap way to get a server. AppleShare, although it doesn't offer many of NetWare's security and reliability features, is considerably cheaper than the most basic NetWare configuration, a dedicated ELS Level II setup that allows only up to eight users.

Introducing Version 2 **4th DIMENSION**

An entirely new Dimension
4th DIMENSION version 1 set the standard for Macintosh databases.

4th DIMENSION version 2 revolutionizes information management by offering the most modern tool for personal, departmental, or distributed usage. It gives business an unquestionable reason to buy Macintosh.

Over 300 new features
Major database operations are from 10 to 100 times faster. More importantly, new functionalities, such as report and label generators, scripts, automatic bidirectional file relationships, data entry into multiple files, automatic button actions, high speed printing, and over 85 new commands save you hours.

Intuitive and configurable
Whether a first time user or an expert, the clear and superior 4th DIMENSION workspace maximizes your efficiency. If you are in a hurry, just point-and-click to create stylish reports, quick mailing labels, or enlightening business charts. If you are a database professional, enrich your SQL interfaces by taking advantage of elaborate array management.



Secure and trustworthy
4th DIMENSION's new password system reflects the structure and intricacies of your organization. 4th DIMENSION also provides you with security and peace of mind thanks to the advanced technology which monitors the system environment and recovers from hard disk damage.

Transparent and extensible
The open architecture allows free and easy interchange of information. From mainframes to other personal computers it may be available wherever it may be. Multi-user capabilities are built-in. If you have TOPs, AppleShare, or 3Com 3+Plus you can let multiple users share a database. 4th DIMENSION is the connectivity leader.

4th DIMENSION is not merely "Macintosh". It is the best database for any personal computer. But don't take our word for it. Call today 800 421 9449 Operator 10, and for \$20 we'll send you a fully functional demo version.

1989 ACIUS, Inc. All trade names referenced are the trademark or registered trademark of their respective holder. ACIUS, ACI and 4th DIMENSION are registered trademarks of ACIUS, Inc. ACI

ACIUS
10351 Bubb Road, Cupertino, CA 95014 (408) 252-4444

Tying the Net

of uninterruptible power supplies (UPSs). Disk mirroring automatically saves your data to two separate hard disks using the same controller; users wouldn't feel the loss of one hard disk. Disk duplexing is functionally identical to mirroring, except that it requires one controller per hard disk. With a duplexed volume, you can lose a hard disk and/or a controller without users' noticing it. Duplexing also give you first-priority access from the hard disk whose heads are nearest to the data. Thus, duplexing provides both an added degree of reliability and a performance increase. UPS monitoring causes the server to shut itself down if the main power is off for too long. A proper shutdown guarantees retention of all data. SFT NetWare is optionally available with the Transition Tracking System (TTS), which is a scheme that ensures the integrity of data from transaction-based server operations.

These features ensure system reliability, but all of them, except TTS, require extra hardware. Because of the necessary extra equipment, the cost of NetWare can get pretty high.

Performance of SFT NetWare

Our suite of tests (see the Performance Charts) showed that NetWare's performance was roughly equivalent to AppleShare's running on an SE/30. The one exception was in the node-to-server file-copy test: NetWare took at least 10 seconds longer. AFP translations to NCP, as well as the fact that NetWare clears a disk block before writing to it (and then verifies the write), account for this. Adding more nodes improved its performance relative to AppleShare's. AppleShare's times went from 26.9 to 31.4 seconds; NetWare's times increased from 42.5 to 45.2 seconds, suggesting that NetWare is superior to AppleShare on larger networks.

Should You Get NetWare?

If you are currently running NetWare and want to add Macs, buy NetWare for Macintosh. For \$200 (owners of the Entry Level System get the Mac value-added process free after sending in a coupon), you can get PCs and Macs talking on a reliable network.

If you don't currently have Net-

The 3Com Solution



With 3+Share, 3Com offers a product functionally similar to Novell's NetWare that performs server-based file transfers among Macs and PCs. 3+Share is a non-AFP-compliant file server that requires a dedicated '286- or '386-based machine. 3+Share offers print-spooling services for PostScript printers for use by both Macs and PCs. On the Mac side, 3+ for Macintosh provides its own Chooser devices, allowing users to choose servers and server volumes. 3Com also has an electronic-mail product, 3+Mail, that allows mail to be exchanged among Macs and DOS and OS/2 machines.

3Com's new product 3+Open, based on OS/2's LAN Manager, will be available in an AFP-compliant version by the end of the year. A 3+Open server will provide all the functionality of 3+Share as a file and print server, in addition to support for AFP and other non-3Com protocols. AFP clients will be able to access a 3+Open server directly via Apple's AppleShare client software.

3+Open also runs on a dedicated '286 or '386 machine. A server can run multiple processes simultaneously. Multitasking lets 3+Open to let server-based applications, such as Microsoft's SQL Server, run concurrently with the standard file-server process; a server machine acts as different types of servers simultaneously, depending on the server application running.

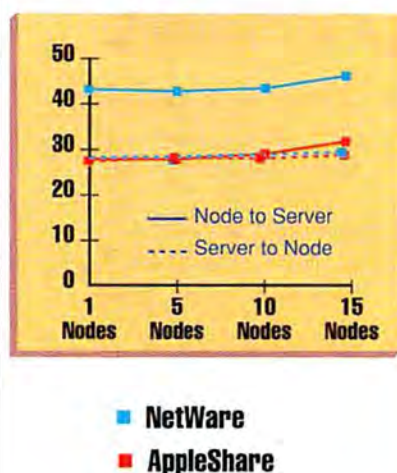
3Com will continue to market 3+Share, even after the release of AFP-compliant 3+Open. The price for 3+Open was not available at press time.

3Com Corp., 3165 Kifer Road, Santa Clara, CA 95052-8145; (408) 562-6400.

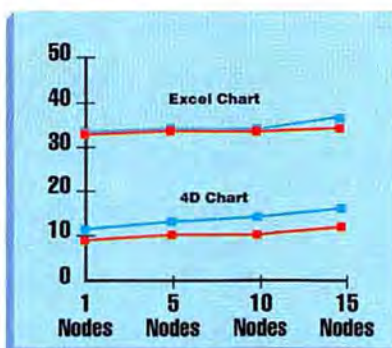
— Stephan Somogyi

Performance Charts

Copy Test



Applications Test



Although performance was roughly comparable when launching Excel and copying the test file from the server to the node, the 4th Dimension record-access test showed a minor difference between the two. Copying the test file from the node to the server was markedly slower with NetWare, mainly because of the overhead involved with any NetWare transaction.



Disposable

There are a lot of removable storage systems that work today but are expensive disposable systems tomorrow. There will probably be a lot more.

There are a lot of fly-by-night mass storage companies that are here today but gone tomorrow. There will undoubtedly be a lot more.

There are a lot of "crash and burn" "at your own risk" "unbootable" and "unreliable" storage systems out there. There will frightfully be a lot more.



Removable

But of all the removable storage systems, there is one that stands superior — The PLI Infinity 40 Turbo, "Best New Storage System of 1989."

Only the Infinity 40 Turbo includes FREE time-saving utilities (\$436 retail value): TurboCache, TurboOptimizer, TurboBack and TurboSpool.

And you can rely on PLI's experience and support. PLI has been making quality drives for the Macintosh since 1985.

The PLI Infinity 40 Turbo — Don't settle for less!

Peripheral Land Incorporated
47421 Bayside Parkway, Fremont California 94538
(415) 657-2211 • FAX (415) 683-9713
Please circle 46 on reader service card.

For a Dealer nearest you call ...
(800) 288-8754

 **PLI**
PLI MUSE AD-05

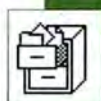
Tying the Net

Ware installed, or if you are running a mainly Macintosh network and are shopping for a server, the choice is not so attractive. AppleShare (50 nodes) is \$799; ELS Level II NetWare (8 nodes) is \$1,595. Furthermore, to get a functional configuration, you'll have to invest in two MS-DOS machines, at least one of which is a '286, and two non-LocalTalk cards in addition to the server's LocalTalk card. And unless you're already a NetWare expert, its complexity means you're going to have to hire someone else to install it. That's a large investment for any

network. Until NetWare can be administered from a Macintosh, it cannot be considered a good Macintosh networking solution. Novell expects to implement this capability

by the end of the year. ☞

Brenda McLaughlin is the former senior editor of *A+* and former associate technical editor at *BYTE*. Stephan Somogyi is *MacUser's* NetWorkShop Coordinator.



Novell NetWare for Macintosh



Comments: Although NetWare for Macintosh offers a range of functions and reliability, for a Mac-based network it's difficult to install and requires a big investment in non-Mac equipment. On the other hand, if you are already running a NetWare server, NetWare for Macintosh is a cheap and efficient addition to your network (it earns a rating of four mice for owners of existing NetWare networks).

Best Features: High reliability; file exchange with non-Mac computers connected to a server.

Worst Features: Expensive; high additional-equipment cost; difficult to install and maintain when compared with AppleShare.

List Price: For Mac networks starting from scratch: ELS Level II, \$1,595; Advanced, \$3,195; SFT, \$4,895. If you have Advanced or SFT Netware 286 version 2.15 or later, \$200; free if you have ELS NetWare 286. Published by Novell, Inc., 122 E. 1700 S., Provo, UT 84606; (801) 379-5900. NetWare for Macintosh version 1.0 and SFT NetWare version 2.15 reviewed. Requires any NetWare 286 configuration, version 2.15 or later. One installation per copy.

America's LARGEST "Mac ONLY" Store...

POWER AND PRICE!

Call our Mac Specialists NOW for the latest powerful Macintosh components & peripherals at the **NATION'S LOWEST PRICES!**

PACKAGE #4
\$6488
 List \$8600. Save Over \$2100.

PACKAGE #5
\$5988
 List \$8800. Save Over \$2800.

Mac II Packages

- 100mb. Hard Drive
- 2mb. Ram Memory
- 256 Color Monitor
- 1.44 FDHD Drive
- 101 Keyboard
- Mac Printer

PACKAGE #1

- 2mb. Ram
- 800k Drive
- Mac Printer
- 101 Keyboard
- 30mb. Drive

\$3488
 List \$6900. Save Over \$1900.

PACKAGE #6

- 30mb. Drive
- 101 Keyboard
- 800k Drive
- Mac Printer
- 2mb. Ram

\$4988
 List \$5200. Save Over \$1700.

SE 30
\$2988
 Our CPU Price With Package Apple's List Price \$4369

Mac Friends

COMPARE OUR ATTITUDE, PRICING, WARRANTY & SUPPORT! WE'RE YOUR MAC STORE!

WE WORK WITH YOU TO DESIGN A MAC SYSTEM TO MEET YOUR SPECIFIC NEEDS.

Credit Cards Leases CODs ... OK!

Call for our **Special Prices** on Hard Drives, Monitors, Scanners, Laser Printers and More!

800 331-1322

TOLL FREE

WE CAN BEAT ANY PRICE ... CALL US LAST!

© 1989 Compu Mart, Inc. AD # 61 Mac, Macintosh™ APPLE COMPUTER, INC.

Please circle 82 on reader service card.

You loved the book. Don't miss the picture.



If you're like most designers whose work goes on press, you've developed a fondness for your PANTONE® Book. After all, it's long been your source for specifying color.

But if you're designing on a Macintosh™ with software that's not Pantone-smart, you're giving up that critical control. And, today, that's just not necessary.

With these leading drawing, painting and page layout programs now providing a PANTONE Palette of over 700 colors on the Macintosh, there's no need to design with less. Use any of these programs and the PANTONE Colors you create with will be colors you can match on press.

In other words,
What You Want Is What You Get.



The QMS ColorScript™ 100 printer permits 4-color comps or proofs with close simulations of PANTONE Colors.

* Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Process color reproduction may not match PANTONE®-identified solid color standards. Refer to current PANTONE Color Publications for the accurate color.

QMS is a registered trademark of QMS, Inc.
ColorScript is a trademark of QMS, Inc.
Macintosh is a trademark of Apple Computer, Inc.

© Pantone, Inc., 1989

For more information, call 1-800-222-1149
(in New Jersey 201-935-5500).

PANTONE
Wherever There's Color.®

Pantone, Inc., 55 Knickerbocker Road, Moonachie, NJ 07074

Please circle 146 on reader service card.



The easiest way to learn Macintosh software is to play it by ear

The fastest way to learn software is to have an expert sit beside you and talk you through the program, step by step. With your hands on the keyboard, trying each new skill as it's explained, learning is a snap.

So Personal Training Systems gives you that expert—on an audio cassette. Each 90-minute tutorial contains the cassette, example files on a disk, and a quick reference card. It's like having your own private tutor . . . only this one works anytime, anywhere, and doesn't charge by the hour.

In addition to training on the Macintosh itself, tutorials are available for Microsoft Excel, Word and Works; Aldus PageMaker and Persuasion; Adobe

Illustrator 88; and HyperCard. Since we offer beginning, intermediate and advanced levels for each software program, there's sure to be one that meets your needs.

All our tutorials are unconditionally guaranteed. You'll learn how to use your Mac or favorite software program—without opening a book or attending a class—or your money back.

So if you're looking for a fast, convenient, affordable way to learn, contact Personal Training Systems by calling 1-800-TEACH-99, or mail in the coupon below. Because we know you have better things to do with your time.



☐ YES, please send me information on
Personal Training for:

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> Macintosh | <input type="checkbox"/> FileMaker |
| <input type="checkbox"/> Excel | <input type="checkbox"/> HyperCard |
| <input type="checkbox"/> Word | <input type="checkbox"/> Persuasion |
| <input type="checkbox"/> PageMaker | <input type="checkbox"/> Works |
| <input type="checkbox"/> Illustrator 88 | |

Name

Company

Street

City State

Zip Number of Macs

PERSONAL TRAINING SYSTEMS

P.O. Box 54240 ■ San Jose, CA 95154 ■ 408-559-8635

800-TEACH-99

MACUSER 9/89

Please circle 68 on reader service card.

Testing, testing . . . MacUser Labs puts 16 popular PostScript printers through their paces.

It seems a distant memory now, but a mere four and a half years ago, only one PostScript printer was available — Apple's LaserWriter. It cost \$7,000 — you can buy a LaserWriter IINTX for that price now — and it was S-L-O-W. But more than even the Macintosh itself, the LaserWriter ushered in the era of desktop publishing.

Before the LaserWriter appeared, would-be desktop publishers had to put up with the ragged appearance and poor readability associated with dot-matrix printers, which output bit maps at a resolution of 72 dots per inch (dpi). The LaserWriter changed all that, offering higher resolution (300 dpi) and a PostScript interpreter. PostScript, a page-description language (PDL) developed by Adobe Systems, could convert an electronic page of text and graphics into crisp, highly legible output at any size or resolution. Finally, the Mac had an affordable, news-letter-quality printer to team up with.

PostScript printers have come a long way since the early days of the LaserWriter. More than 40 Adobe-licensed PostScript printers are currently on the market, ranging in resolution from 300 to 2,540 dpi. Engine speeds for the toner-based, black-and-white models are rated from 6 to 40 pages per minute. There are also several high-end PostScript imagesetters, which use photographic-imaging technology rather than toner. In addition, PostScript has gone color (see Figure 1). Color printers from two companies are on the market, with more undoubtedly on the way.

And those are just the Adobe-sanctioned printers. PostScript clones are now entering the market. These PostScript-compatible printers have non-Adobe interpreters and impressive throughput performance.

Configurations and capabilities vary widely among PostScript printers. Some come with a single paper tray, others come with two or three. Some can emulate Diablo 630 printers, others imitate HP LaserJets, and one (the

Camintonn TurboLaser) can even pretend to be a DEC LN03. They all come with LocalTalk, Centronics parallel, and serial connections. A growing number support external hard disks to which you can download large font libraries from the Mac.

A Motley Crew

With all these variables, buying decisions are no longer simple. What better reason for MacUser Labs to round up 16 of the most popular desktop models and put them through their paces? We looked at one model from each vendor that markets a LocalTalk-compatible, 600-or-fewer-dpi PostScript printer. We let vendors that sell more than one model choose which one to send for evaluation. (Some chose not to send one at all.) We let Apple enter two contestants, the NT and the NTX.

The printers we tested fall into four categories. Most are 300-dpi models that are more or less variations on the theme of the LaserWriter Plus or IINT. We call them the "standards."

Three printers are notable for their throughput speed. Based on Motorola 68020 microprocessors, they are significantly faster than first-generation 300-dpi PostScript printers, which are all based on the 68000 chip. These three we refer to as "high-performance" printers.

Three other printers — they're actually the same machine, sold by different companies — don't use Adobe-licensed PostScript interpreters, although they are PostScript-compatible. These are the "clones."

Finally, two printers have higher-resolution print engines, which produce better-looking type and subtler shades of gray. These "high-resolution" printers also have high prices, and people buy them specifically for their increased resolution, not because they are faster or easier to maintain. We included them to give you a taste of the future — or, at least, the future of PostScript printers.

**By Henry Bortman, Aileen Abernathy,
and the MacUser Labs staff**

Figure 3: Printer Performance

	Average	Word 3.01	PageMaker 3.0	Excel 1.5	Illustrator 88
High Performance					
Apple LaserWriter IITX	1.76	1.23	2.18	1.93	1.91
Dataproducts/ATI printers	2.03	1.80	2.31	2.34	2.07
The Clones					
Qume/Jasmine/LaCie clones	1.37	1.09	0.43*	1.52	2.48
The Standards					
Apple LaserWriter IINT	1.00	1.00	1.00	1.00	1.00
Camintonn TurboLaser/PS-PLUS 3	1.13	1.18	1.21	1.14	1.14
Fujitsu RX7100PS	1.07	0.84	1.02	1.18	0.82
GCC Business LaserPrinter	1.13	0.82	1.12	1.16	1.18
IBM Personal Page Printer II	1.20	0.85	1.23	1.24	1.28
NEC Silentwriter LC 890	0.98	1.32	0.94	0.86	0.95
QMS-PS 820	1.19	1.17	1.26	1.21	1.23
Ricoh PC Laser 6000/PS	1.18	0.88	1.20	1.21	1.27
High Resolution					
AGFA P3400PS	1.73	1.71	1.87	2.26	1.68
Varityper VT600P	1.42	1.40	1.30	1.74	1.36
Apple LaserWriter Plus (v. 42.2)	0.90	0.89	0.90	0.88	0.88
Apple LaserWriter Plus (v. 38)	0.69	0.83	0.75	0.68	0.45

*The PageMaker test uses downloadable fonts. Times shown reflect Adobe fonts for the PostScript printers and equivalent Bitstream fonts for the clones.

†The clones couldn't print the MacDraw file. Qume said that ROM version 3.0, which should be available by now, will fix this and other known problems.

‡The Camintonn TurboLaser couldn't print the Adobe Separator files. Adobe hadn't provided Camintonn with a ROM upgrade at press time.

§The obsolete PostScript v.38 in the LaserWriter Plus couldn't print the MacDraw II or SuperPaint 2.0 files.

Each printer was evaluated based on its performance, print quality, and ease of use. Performance simply means raw printing speed, and, needless to say, the high-performance printers did best here. To evaluate print quality, we examined both type and graphics output. The clones did surprisingly well, as did Varityper's 600-dpi printer. Finally, we noted how easy each printer was to set up and maintain. For the specific results of these investigations, see the Capsule Reviews.

What Does PostScript Do, Anyway?

The intricate code of the PostScript

page-description language describes the lines, curves, halftones, and characters that compose the image on a page. PostScript tells a printer where to put each element on the page, how large to make it, what angle to rotate it to, whether to draw only the object's outline or to fill it in, and what color or shade of gray it should be.

When you print to a PostScript printer, you tell the Mac to send it a PostScript program describing the pages of your document. Inside each PostScript printer is a computer (don't be shocked), usually the same Motorola 68000 or 68020 chip that is the heart of many Macs. But unlike

the CPU in your Mac, which can be programmed to do a variety of tasks, the microprocessor in a PostScript printer is dedicated solely to interpreting PostScript instructions.

Other PDLs exist, but Adobe's PostScript has captured the dominant position in the Mac market and so has become the de facto standard. QuickDraw, the Mac's imaging model, can also be considered a PDL, although Apple doesn't call it that. It can display to a Mac screen or output to a printer such as the ImageWriter II or LaserWriter IISC. Even though QuickDraw offers some features

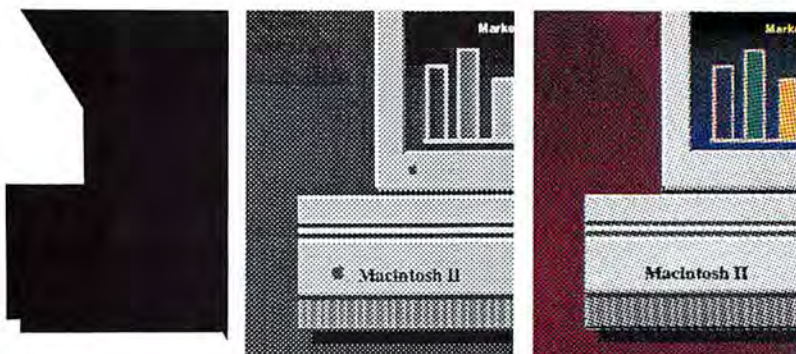


Figure 1: Color PostScript

The LaserWriter driver (version 5.2) doesn't support color PostScript. As a result, color files usually end up looking like the PowerPoint image on the left. However, Apple recently released version 6.0 of the LaserWriter driver, which accurately prints color files from any application (right). It also translates color information correctly into gray scale when printing to a black-and-white PostScript printer such as the LaserWriter IITX (center), although printing times are significantly longer than for black-and-white images.

	MacDraw II	SuperPaint 2.0	Digital Darkroom	Separator 2.0
	2.72	1.10	0.99	2.05
	3.57	1.16	1.00	2.01
NA [†]		1.00	1.05	2.05
1.00		1.00	1.00	1.00
1.48		0.80	0.99	NA [‡]
1.38		1.19	1.09	1.09
1.55		0.91	1.08	1.20
1.73		1.02	0.97	1.30
1.17		0.88	0.99	0.91
1.63		0.81	0.99	1.21
1.72		0.91	0.97	1.29
3.08		0.90	0.97	1.58
2.34		0.93	0.95	1.34
0.87		0.80	1.00	0.88
NA [∞]		NA [∞]	0.89	0.51

Performance results are normalized against those for the LaserWriter IINTX. If another printer performed faster, its number is larger. The clone printers are identical, so their times are shown only once. The Dataproducts and ATI printers also share a set of performance data.

Test platform: Mac II, 5 Mb RAM, System 6.0.2, LaserWriter driver 5.2. The printers were tested with eight documents. **Word 3.01:** A 25-page manuscript using 12-point Times. **Page-Maker 3.0:** An eight-page newsletter with seven downloaded fonts and PICT, EPSF, and TIFF images. **Excel 1.5:** A spreadsheet of 26 columns and 52 rows. **Illustrator 88, v.1.8.3:** An object-oriented drawing containing multiple paths, rotated text with special effects, and a full range of grays. **MacDraw II, v.4:** A complex document with hundreds of ovals rotated asymmetrically, which taxes the memory and computational powers of the PostScript interpreter. **SuperPaint 2.0:** A bit-mapped image. **Digital Darkroom 1.0:** A black-and-white halftone image scanned in 6-bit gray-scale mode, saved as a TIFF file, and printed from Digital Darkroom, using standard halftone settings. **Adobe Separator 2.0:** A four-color separation of the Illustrator document.

that PostScript lacks, such as the ability to place one image transparently on top of another, PostScript has several major advantages over it.

Outline Fonts

PostScript's most significant advantage is that it stores descriptions of font characters as outlines, rather than as bit maps (see Figure 2). No matter how wretched the type looks on your Mac screen, it comes out clean on a PostScript printer. And you can manipulate type as easily as you can graphics. If your application allows it, you can scale type to any

size—we recently produced some 1,100-point type for a project—and still get crisp, smooth characters from your printer. Programs such as Illustrator and Free-Hand let you squeeze, stretch, shear, and rotate type, and because PostScript is manipulating outlines, it still comes out looking good.

QuickDraw, in contrast, yields printed output that suffers from the same jaggies that Mac screen displays do. To minimize the jaggies, you must install a screen font for each point size of every font you want to use. Your System file can quickly grow to gargantuan proportions if you

use many type sizes and install a screen font for each. (You can use Font/DA Juggler or Suitcase to keep the size of your System file down, but the fonts will still take up a lot of space on your hard disk.) For larger font sizes (say, 72-point) or odd sizes (31-point), the screen fonts required to produce optimal QuickDraw output aren't even available.

The entire Macintosh typographic scenario will soon change. In the next few months, Adobe will release Adobe Type Manager, which lets you use PostScript printer fonts to produce better-looking type on the Mac screen, with no jaggies

PostScript (LaserWriter IINTX)



QuickDraw (LaserWriter IISC)



Figure 2: PostScript versus QuickDraw

The LaserWriter IINTX (output on left) contains a PostScript interpreter, and the LaserWriter IISC (output at right) relies on Apple's QuickDraw. As a comparison of this 13-point Times Roman type shows, PostScript does a far better job of imaging type at odd sizes. PostScript is also better at handling rotated images and hairlines (1-pixel-wide lines).

**MECHANICAL DESIGN.
AUTOCAD® HAS THE TASK
COMPLETELY IN HAND.**



From initial design concepts to final production drawings, AutoCAD® is the standard for mechanical design because it covers all the applications.

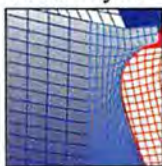


As the industry's standard for computer-aided design software, AutoCAD adds value to your

mechanical design every step of the way. Its sheer drawing power, compatibility with allied engineering applications, file portability to other computer systems and extensive third-party support represent a comprehensive design-through-completion solution.

Think 3-D, design 3-D.

AutoCAD's 3-D design capabilities make complex designs easier to develop and communicate to others. This allows you to explore more options and make better decisions earlier in the design process.



Create freely in 3-D space, using your own coordinate system on the construction plane that you define. Powerful drawing commands, including a range of surface definition tools, help you build more complex and accurate models.

AutoCAD runs on a variety of industry-standard personal computers and engineering workstations. AutoCAD's file portability allows seamless transfer of drawings and applications between different hardware platforms and operating systems without file conversion.

The new dynamic viewing commands help you look at your ideas from any perspective, interactively, in real-time.



This gives you a firmer grasp on your design as it proceeds to the next phase.

AutoCAD in, applications out.

AutoCAD files are highly portable so your design geometry can be used in solid modeling, finite element analysis, electrical schematic verification, tolerancing...a full spectrum of design engineering applications.

Handle many of these tasks with other products in the Autodesk family, like AutoSolid™ and AutoShade®. Take on even more with AutoCAD software enhancements from Autodesk's network of third-party supporters...the world's largest. And still others import AutoCAD files through Autodesk's industry-standard DXF™ or IGES interfaces.

The end result is that AutoCAD gets everyone speaking the same language—from designers and drafters to production planners—because everyone's using the same geometry.

Draft your designs.

AutoCAD's powerful drafting tools let you detail your designs

without having to redraw them. Dimensions are fully associative and can be placed automatically with a few simple commands. Change the drawing and the dimensioning changes as well.

AutoCAD's fully-associative databases allow you to link graphical entities in your drawings to the words and numbers that describe them. A file of these attributes can be output from AutoCAD for manipulation and reporting by a number of third-party programs to



produce specifications tables, bills of materials and instruction manuals.

Results by the handful.

AutoCAD represents the best value for your mechanical CAD application. From its powerful drawing features to its widespread support, AutoCAD gives you as much return on your investment as you can handle. Call 800-445-5415, ext. 23, today to find the Authorized Autodesk Dealer or Training Center nearest you.



AUTODESK

2320 Marinship Way, Sausalito, CA 94965

800/445-5415, ext. 23

Please circle 162 on reader service card.



Autodesk, the Autodesk logo, AutoCAD and AutoShade are registered in the U.S. Patent and Trademark Office by Autodesk, Inc. AutoSolid is a registered trademark of Autodesk, Inc. ANSYS is a registered trademark of Swanson Analysis Systems, Inc.

Figure 4: The Life of a Character

When you issue the Print command, the printer's driver converts the QuickDraw image of the page into PostScript commands and ensures that the printer has the correct fonts. As part of the conversion process, screen fonts, which are 72-dpi bit maps, are translated into the corresponding PostScript outline fonts. This data is sent to the printer, which

has a circuit board containing ROM with built-in fonts and the PostScript interpreter, plus the RAM used for downloading fonts and creating bit-mapped images of the pages. Once the printer has scaled and rotated the outline fonts, they are converted into 300-dpi bit maps for printing (a printer can output only dots).

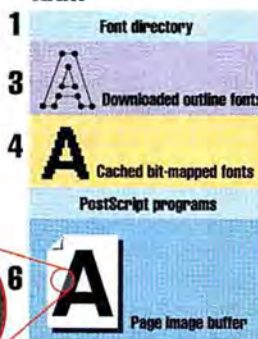
— Chip Carman

1. When the printer is first turned on, the PostScript interpreter builds a font directory of its built-in outline fonts and of those stored on any attached hard disks.

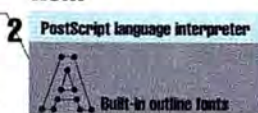
2. As the interpreter begins processing a document, it checks the requested fonts against its font directory. If a desired font isn't on the list, the interpreter searches your System disk for an outline-font file to download. As outline fonts are converted to 300-dpi bit maps, they are sent to the page-image buffer and also stored in the font cache. (Very large fonts are placed only in the page-image buffer. Large fonts are stored in the cache in compressed form and must be decompressed when used again.)

3. When the interpreter locates a desired outline font, it is downloaded either to RAM or to a hard disk. (Downloading to RAM is temporary; downloading to disk is permanent and saves time.) If no outline font is available, a 72-dpi screen font is downloaded.

RAM



ROM



IINTX hard disk

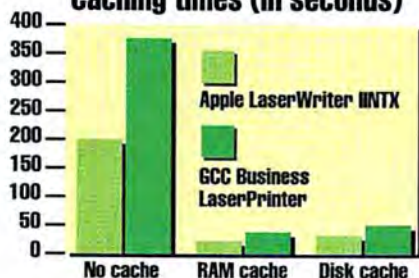


4. The font cache is a portion of RAM that contains 300-dpi bit maps of each size and orientation of every character processed. The stored bit maps are instantly available to the interpreter, which greatly speeds up processing times. Another technique to increase processing speed is idle-time caching. When the printer is idle, it automatically finds built-in printer fonts, converts them to bit-mapped fonts, and places them in the font cache.

5. When no more memory is available in the RAM cache, the least-accessed bit maps are flushed to make room for new ones. If the printer has a hard disk attached, the cast-out bit maps are transferred to it.

6. After the entire page has been assembled in the page-image buffer, each line is transferred in a serial bit stream to the print engine. The zeros and ones in the bit map act as on/off codes to control the light reaching the photosensitive drum.

Caching times (in seconds)



Font caching improves printer performance tremendously. We printed a document that contained more than 1,000 different characters, each of which had to be converted from an outline to a bit map by the PostScript interpreter. Without caching, the document took 3:18 minutes to print on the LaserWriter IINTX and 6:12 on the GCC Business LaserPrinter. With characters cached in the printers' RAM, times dropped dramatically (29 seconds for the NTX; 38 for the BLP). Times were almost as good for characters cached on an attached hard disk.

even at large point sizes. Apple, for its part, recently announced its own outline-font format, which will be incorporated into System 7.0. It will give Mac users a way, without relying on PostScript fonts, to improve the appearance of type, both on the Mac screen and when printed to non-PostScript printers. (For more on the Adobe and Apple announcements, see Fine Print in the DTP section.)

These new strategies from Adobe and Apple are making big waves in both the font and printer markets. Because we don't know exactly how the technologies will work (and neither company has committed to a shipping date), it's a little early to say how these changes will affect the market. For the near term, however, PostScript printers are unlikely to be toppled from their current dominant position. Even Apple has too high a stake in PostScript output to abandon them.

PostScript's Other Pluses

The PostScript imaging model also employs Bezier curves, which let you create graphic images that are more

complex than what you get with QuickDraw's simple arcs. Illustrator, Cricket Draw, and FreeHand were the first to take advantage of Bezier curves, but many of today's drawing programs offer a Bezier tool. Each program must produce the curves with special code, however, because QuickDraw doesn't provide the underlying technology.

PostScript also lets you rotate any object, including type, to any angle and still obtain sharp, clean output. QuickDraw is not inherently as versatile. Again, QuickDraw-based programs such as MacDraw II now support this capability, but they must "step outside" QuickDraw to accomplish it. And when you print a document that includes rotated objects to a printer that relies on QuickDraw, it won't look as clean as the same document printed to a PostScript device — unless the application has some fancy programming to improve the QuickDraw output. Apple has specifically stated that the QuickDraw imaging model won't be enhanced in System 7.0 to include support for rotation; application developers will still have

to pull this one off on their own.

Finally, PostScript is "device-independent." That is, it automatically takes advantage of the maximum resolution of whatever PostScript output device you use, from a 300-dpi desktop printer such as the LaserWriter to the 2,540-dpi Linotronic imagesetter. This ability extends to Display PostScript as well. For example, the same PostScript code that drives the 90-dpi display of a NeXT machine can be sent to a PostScript printer; each device will make maximum use of its available resolution and gray-scale/color capabilities to create the final image. QuickDraw is not nearly as flexible.

Choosing the Right Printer

Of course, we're preaching to the converted. You're already sold on the value of a PostScript printer. What you want to know is which one to buy.

Start by analyzing your needs. What kind of documents do you plan to print? What about a year or two from now? You'll probably have your printer for at least that long. Do you plan to use lots of different typefaces, or will you be using only those that come resident in the printer? If you won't be using nonresident fonts, you may find a PostScript clone a more attractive choice. Will you be printing many gray-scale halftone images? If so, focus your selection on those printers that did well on our gray-scale-quality tests.

How many people are going to share the printer? Will PC users as well as Mac users be printing to it? All the printers work with PCs as well as Macs, but some are better designed for this task than others. Look for one that supports multiple connections or can emulate the other printers you already have.

Will you be using different paper sizes — legal-sized paper and envelopes as well as letter-sized paper? You may want a printer with two trays. Will you be using this printer to produce camera-ready copy for reproduction on an offset press? Consider a printer with a resolution greater than 300 dpi.

These are some of the questions you should answer before going shopping. Knowing your particular requirements is the best guarantee that you won't end up



Worth the RISC?

The real bottleneck in PostScript printing is not the mechanical churning of paper through the print engine but is, rather, the task of creating an image of each page in memory. It stands to reason that the more powerful the printer's processor, the faster the printer.

RISC chips represent a trend in microprocessor technology that has the potential to dramatically increase printers' throughput. Case in point: The Qume CrystalPrint Publisher and the other PostScript-printer clones are rated at only 6 pages per minute (ppm), yet thanks to the RISC chips they employ, these printers rival the speed of the 8-ppm LaserWriter IINTX. How is this possible?

RISC (reduced-instruction-set computer) chips are streamlined microprocessors that execute most of their instructions in one cycle of the system clock. (Microprocessor speed is rated in megahertz, or millions of cycles per second.) In contrast, non-RISC chips require several cycles to perform each instruction.

With their greater efficiency, RISC chips often have a higher MIPS (millions of instructions per second — a common measure of raw power) rating than do microprocessors

that are rated several times faster in megahertz. For example, the 16-megahertz Motorola 68020 at the heart of Apple's LaserWriter IINTX is rated at 2 MIPS, whereas the 4-megahertz Weitek XL-8200 RISC chip inside the Qume CrystalPrint Publisher pumps out 4 MIPS.

Microprocessors that control PostScript printers perform many complex functions, including scaling fonts, producing bit maps, and placing objects. RISC chips are particularly good at doing these mathematical computations . . . fast. Some even have multiplication and division capabilities, which come in handy when performing the third-order polynomials associated with font scaling and bit mapping.

Not only can RISC chips help squeeze greater performance out of PostScript printers, but their power also can be brought to bear on almost any computation-intensive task. It's been rumored that Apple will incorporate Advanced Micro Devices' AM29000 general-purpose RISC chip in the next high-end Mac in order to speed up QuickDraw routines, 32-bit color, and Apple's new outline-font scheme.

— Andrew Eisner

HARD DRIVES



MiniScribe
Solutions for Data Storage

HARD DRIVES
International
An IDN Company

Three great names, one low price!

The **BIGGEST** name in low priced hard drives comes to **MACINTOSH™**.

HARD DRIVES International . . .

- Our Multi-Million Dollar buying power assures the lowest possible prices.
- Friendly, knowledgeable sales staff will help you choose the drives you need.
- Factory-trained technicians in our Technical Department can assist you with trouble-free installation and setup of your hard drive.
- Helpful Customer Service Representatives provide service after the sale.
- All products include a **One Year Warranty** and our **30-day "Worry-Free" Guarantee**.

HARD DRIVES
International
An IDN Company

1912 W. 4th Street
Tempe, Arizona 85281
(602) 967-5128
FAX: (602) 829-9193

1-800-234-DISK

International Orders: (602) 967-7435

Phone Orders: 7am — 7pm Mon. — Fri.
10am — 4pm Sat. (MST)

Customer Service: 1-800-234-5197
TELEX: 405765

INTERNAL KITS FOR SE & II

20Mb Seagate	40ms	\$299
30Mb Seagate	40ms	\$359
45Mb Seagate	40ms	\$399
80Mb Quantum	19ms	\$775

INTERNAL KITS FOR MAC II ONLY

65Mb Seagate	40ms	\$479
160Mb MiniScribe	17ms	\$1222
340Mb MiniScribe	16ms	\$1795

These complete internal drive kits include the drive, UniMac™ formatting & partitioning software, hardware mounting kit, all necessary cabling, and How-To manual.

EXTERNAL DRIVES FOR MACINTOSH PLUS, SE & II

20Mb Seagate	40ms	\$379
30Mb Seagate	40ms	\$439
45Mb Seagate	40ms	\$499
60Mb Seagate	40ms	\$549
80Mb Seagate	28ms	\$599
80Mb Quantum	19ms	\$919
160Mb MiniScribe	17ms	\$1275
340Mb MiniScribe	16ms	\$1895

External drives include drive, UniMac™ external case, power supply, cabling, formatting & partitioning software.

MEMBER
MMC
MICROCOMPUTER
MARKETING COUNCIL
of the Direct Marketing Association



**Never A Surcharge
For MC and Visa**

Price and availability subject to change. All items are new with manufacturer's warranty. 5% surcharge for American Express and COD orders. PO's accepted 2% 10 days, NET 20, subject to 9% surcharge. 30-day Guarantee conditions: shipping & handling charges not refundable; product must be in original condition. Add \$20 shipping for Overseas Military APO/FPO EXPRESS Delivery. Hard Drives International is a division of Insight Distribution Network, Inc. MACINTOSH is a registered trademark of Apple Computers, Inc.



**30-day
"Worry-Free"
Guarantee**

If for any reason, you are not completely satisfied with any product, simply return it for a prompt and courteous refund!

MCU 0989

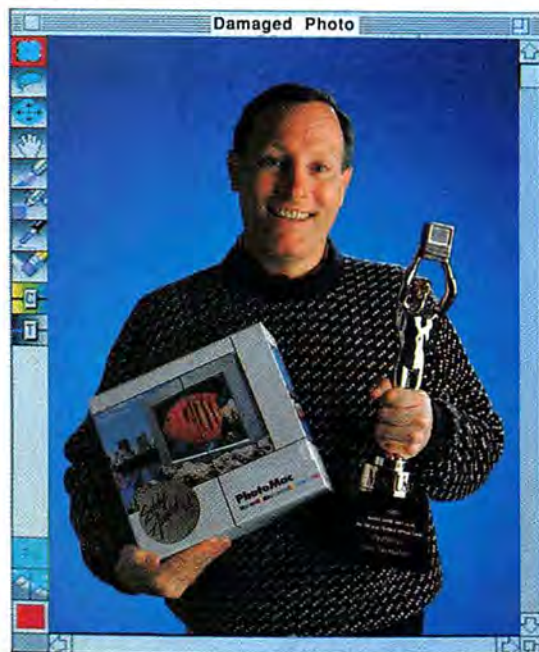
10 A.M.

Missing photo finally arrives.
Badly damaged.



11 A.M.

PhotoMac restores image completely
and moves it into page makeup.
Whew!



Fred Molinari, President, Data Translation.
Retouching by PhotoMac, recipient of the
1989 Eddy Award.

PhotoMac simply defies reality.



This is the amazing new software everyone's talking about. PhotoMac® color photodesign software for the Mac® II. Finally. A photo retouching, design, and color separation package developed specifically to work with Aldus PageMaker®, QuarkXpress™ and Letraset's® Ready-Set-Go!™

You'll be amazed at how effectively you can retouch images with PhotoMac. And how easy it is to move your retouched image right into page makeup. Think of it as a new reality for desktop picture publishing. Because it is.

PhotoMac not only works wonders with page layout software, it's also compatible with color scanners, printers, film recorders and supports Data Translation's ColorCapture™ videographics board, too. What's more, you can use PhotoMac to output high-resolution CMYK process color separations. What's less, the complete PhotoMac package costs just \$795

To order immediately: (508) 485-3322

For a dealer near you: (800) 535-0900

PhotoMac is distributed by Data Translation, 100 Locke Drive, Marlboro, MA 01752. Telephone (508) 485-3322; and by Bonsu Corporation, 631 River Oaks Parkway, San Jose, CA 95134. Telephone (408) 434-0433. PhotoMac is a registered trademark of Avalon Development Group. All other trademarks and registered trademarks are the property of their respective holders.

PhotoMac®



Figure 5: How It Works

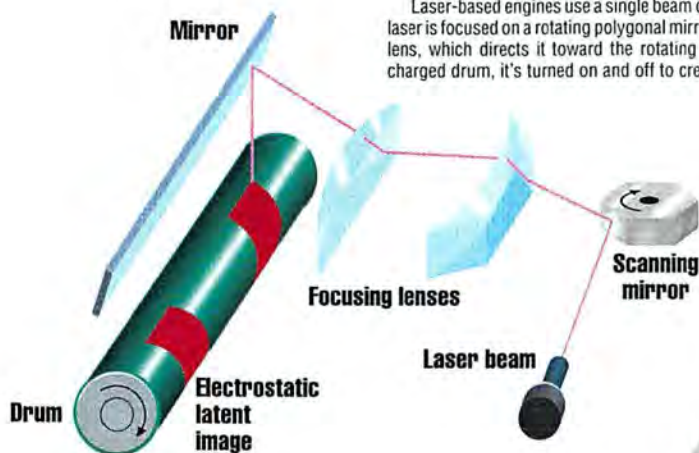
Most desktop PostScript printers use laser beams to create images. Two new technologies, light-emitting-diode (LED) array and liquid-crystal-shutter (LCS), provide cost-effective alternatives. All three use light to form an image on a photosensitive drum. Laser beams scan

across the drum one dot at a time; LED and LCS engines print an entire line simultaneously. Once the image is formed on the drum, toner is applied and then transferred to the paper, after which it is fused onto the paper and the image emerges from the printer. — Chip Carman

1. The light source

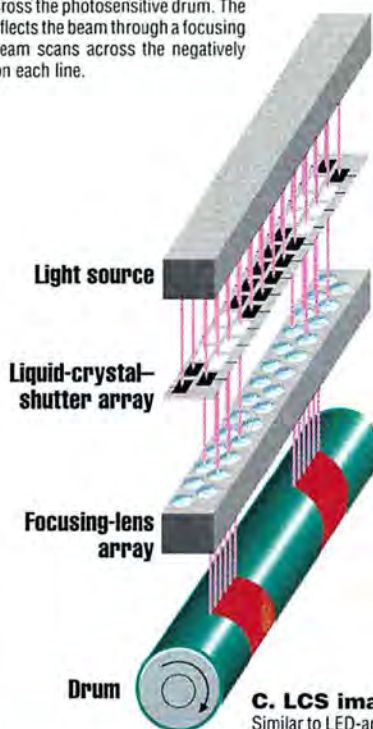
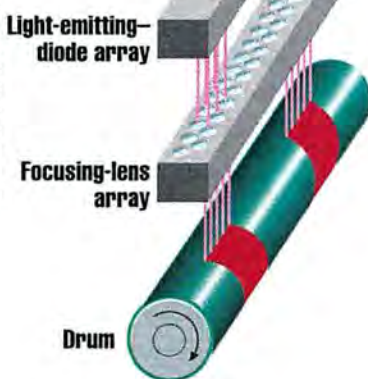
A. Laser imaging

Laser-based engines use a single beam of light to scan across the photosensitive drum. The laser is focused on a rotating polygonal mirror. The mirror deflects the beam through a focusing lens, which directs it toward the rotating drum. As the beam scans across the negatively charged drum, it's turned on and off to create the pattern on each line.



B. LED imaging

These engines use 2,400 light-emitting diodes to produce an entire line of dots at once. Individual diodes are turned on or off to create the necessary patterns. Dot positioning using LED technology is always accurate because the array of LEDs is fixed, while laser engines require an optical system that is more susceptible to misalignment due to vibrations. LEDs are also less sensitive to heat, dust, and humidity, but current LED printers are limited to 400 dpi. Overlapping arrays will allow for higher resolutions in the future.



C. LCS imaging

Similar to LED-array engines, LCS technology forms an entire line simultaneously. Each of the 2,400 liquid-crystal shutters can open or close, controlling the amount of light that reaches the photosensitive drum. The shutters are matrices of liquid-crystal cells, which have molecules arranged so that light passes through them when the power is off. When a charge is applied, the crystal untwists, preventing light from passing through the cell.

with a printer that has features you couldn't care less about but that is a poor choice for the tasks you bought it for.

Speed Demons

If you've ever waited around for a page to come out of a printer, you know how important printer performance is. When we say *performance*, we mean speed, pure and simple. Output quality and ease of use are separate considerations.

In the past year and a half, two printers have raised users' performance expectations to new heights: Apple's LaserWriter IINTX and the Qume CrystalPrint Publisher (also marketed by Jasmine and LaCie). The NTX is important because it was the first 300-dpi printer to use a 68020 chip in its PostScript controller. Just as the 68020 gave the Mac II a significant performance edge over the 68000-based Plus and SE, the 68020 in the NTX

makes that printer 75 percent faster than the 68000-based NT. Since the introduction of the NTX, other 68020-based printers have come to market, some of which — the Dataproducts and ATI models, for example — perform even faster. Both QMS and NEC have announced 68020-based PostScript printers (which should be available as you read this), and others undoubtedly will follow.

The NTX additionally introduced a

2. Preparing the OPC

The drum is coated by a layer of optical photoconductor (OPC), such as amorphous silicon. This material can hold an electrical charge, which it loses when exposed to light. An electrostatic charger, called the primary corona, prepares the OPC to receive an image by giving it a negative charge.

3. Creating the image

Light hits the OPC, producing positive charges wherever it touches; these areas are surrounded by negatively charged regions. This invisible image, formed through the difference in surface charges, is called the electrostatic latent image.

7. Cleaning up

After the image is transferred to paper, a blade wipes the drum clean of any remaining toner, and an eraser lamp neutralizes the charged OPC, enabling it to begin the process again.

Heated roller

Fusing roller

6. Fixing the image

The paper moves through pressure rollers. The upper roller is heated to the melting point of the toner's resin (about 160 degrees centigrade). This process of pressing and melting, called fixing, forces the toner to bond with the paper.

5. Putting it on paper

Beneath the drum is the transfer corona, a narrow trough with a few twists of thin wire. As paper moves through the printer, the corona gives it a positive charge. This positive charge attracts the negatively charged toner, pulling it from the OPC to the paper. As the drum rotates, the image is transferred onto the paper.

4. Adding toner

Toner is composed of magnetic particles, pigment, and resins. It also receives a negative charge. The internal magnet in the developer roller attracts the magnetic particles in the toner, creating a thin layer of toner on the roller. As the drum rotates, the latent image passes by the roller. The negatively charged toner jumps to the OPC, where it adheres to the positively charged image and is repelled by the negatively charged regions.

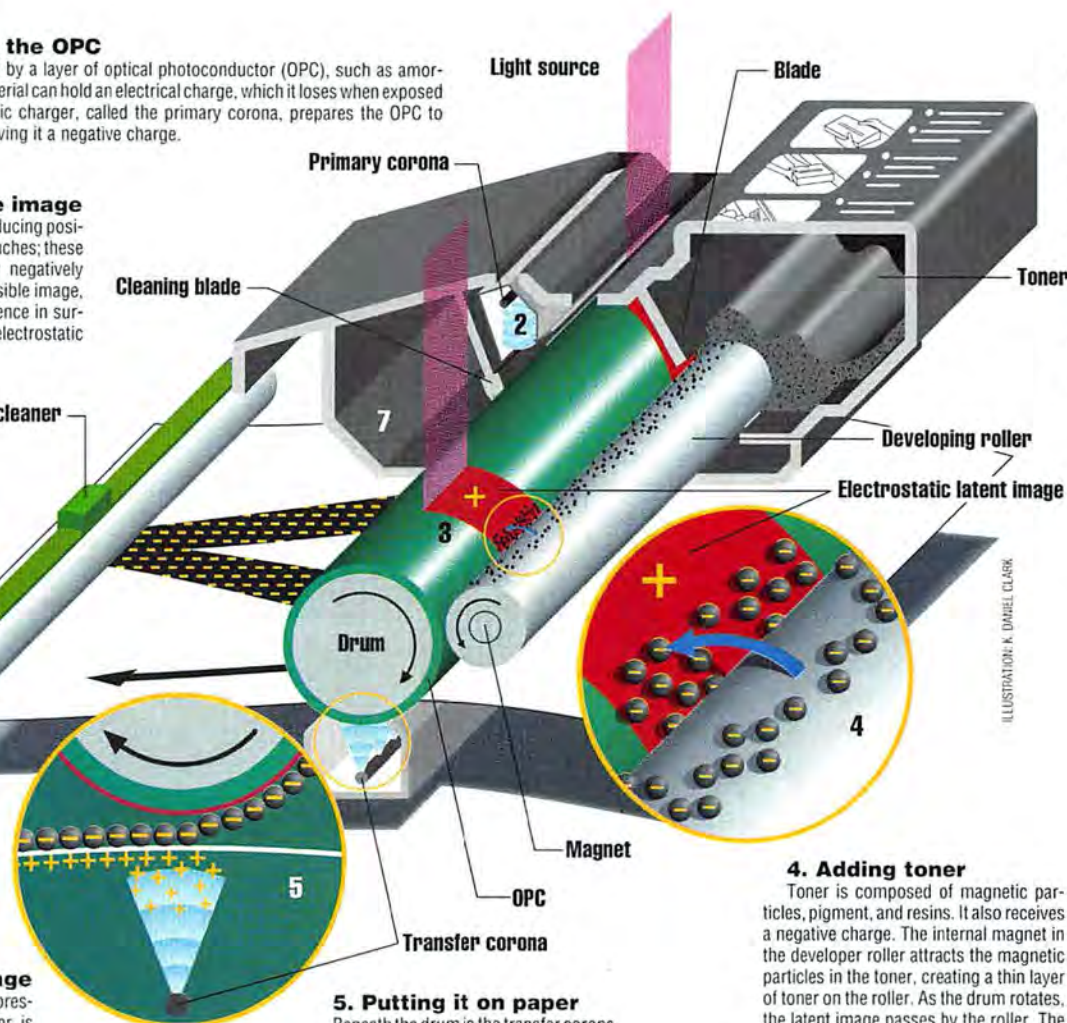


ILLUSTRATION: K. DANIEL CLARK

second innovation. It was the first desktop PostScript printer to offer a dedicated SCSI hard disk as an option. Printer fonts are downloaded to this hard disk, which dramatically speeds the printing of documents that use lots of different typefaces or many sizes of the same typeface.

The Qume CrystalPrint Publisher is also fast. Very fast. But it's a very different animal from the other printers tested. It's a clone, the first mass-market Post-

Script clone. The PostScript interpreter in this printer isn't licensed from Adobe, and it can't use Adobe fonts. Instead, Qume developed its own version of PostScript in-house, and the 35 resident typefaces are supplied by Bitstream. Furthermore, the interpreter is fueled by a RISC chip from Weitek, not by a Motorola 68000-family microprocessor (see the "Worth the RISC?" sidebar). The Qume clone is 50 percent faster than the NT, and

it lists for \$500 less (the Jasmine and LaCie machines list for \$1,500 less than the NT).

To test the performance of our 16 printers, we fed them documents from Word, PageMaker, Excel, Illustrator 88, MacDraw II, SuperPaint, Digital Darkroom, and Adobe Separator. The speed of the LaserWriter IINT was the standard for performance comparison. Figure 3 shows the relative speeds for each of our

test documents and an average of all the tests. As expected, the high-performance printers (NTX, Dataproducts, ATI) led the pack, with the clones finishing a respectable second. (Actually, the high-resolution printers were the runners-up, but people buy them specifically for their

resolution, not for their speed.)

Performance Factors

Several factors — including microprocessor speed, RAM, and print-engine speed — affect performance. The most important of these is the speed of the

printer's microprocessor. As previously indicated, printers with 68020 chips are inherently faster than those with 68000s. The clones, which use RISC technology, perform somewhere in between, usually closer to the 68020-based machines.

RAM can also affect throughput. Most

Table 1: Features of PostScript Printers

	High Performance			The Clones			The Standard
	Apple LaserWriter IINTX	Dataproducts LZR 1260	ATI LaserPrint 1275	Qume CrystalPrint Publisher	Jasmine DirectPrint	LaCie Panther PDX	Apple LaserWriter IINT
General							
Retail price	\$6,999	\$7,995	\$8,595	\$4,499	\$3,495	\$3,495	\$4,999
Engine model	Canon LBP-SX	Toshiba A-739	Toshiba A-739	Casio LCS 130	Casio LCS 130	Casio LCS 130	Canon LBP-SX
Engine type	laser	laser	laser	liquid-crystal shutter	liquid-crystal shutter	liquid-crystal shutter	laser
Engine life (pages)*	300,000	600,000	600,000	180,000	180,000	180,000	300,000
Microprocessor	Motorola 68020	Motorola 68020	Motorola 68020	Weitek XL-8200 RISC	Weitek XL-8200 RISC	Weitek XL-8200 RISC	Motorola 68000
Clock speed (MHz)	16.7 MHz	16.7 MHz	16.7 MHz	4 MHz	4 MHz	4 MHz	11.2 MHz
Speed (pages per minute)	8 ppm	12 ppm	12 ppm	6 ppm	6 ppm	6 ppm	8 ppm
Resolution (dots per inch)	300 dpi	300 dpi	300 dpi	300 dpi	300 dpi	300 dpi	300 dpi
PostScript version	47.0	47.1	47.1	47.0 clone	47.0 clone	47.0 clone	47.0
Memory (standard/max)	2 Mb/12 Mb	4 Mb	4 Mb	3 Mb	3 Mb	3 Mb	2 Mb
Hard disk availability	optional	optional	optional	none	none	none	none
Resident fonts (number)	35	35	35	35 Bitstream	35 Bitstream	35 Bitstream ¹	35
Paper handling							
Paper output (face up/down)	up/down	up/down	up/down	down	down	down	up/down
Paper weight	16 to 36 lb	16 to 21 lb	16 to 21 lb	16 to 24 lb	16 to 24 lb	16 to 24 lb	16 to 36 lb
Paper trays; capacity	1 tray; 200 sheets	1 tray; 250 sheets	1 tray; 250 sheets	1 tray; 100 sheets	1 tray; 100 sheets	1 tray; 100 sheets	1 tray; 200 sheets
Auto feed (paper sizes)	letter	ltr, A4, A5, B5	ltr, A4, A5, B5	letter	letter	letter	letter
Manual feed (paper sizes)	yes (A4, B5, envs)	yes	yes	no	no	no	yes (A4, A5, envs)
Other standard features	none	none	none	none	none	none	none
Options	leg tray, \$89; env feeder, \$89	leg tray, \$95; env feeder, \$1,095;	leg tray, \$95; env feeder, \$995; dual- input cassette, \$895; output jogger, \$125	leg, A4, B5 trays, \$69 each	leg, A4, B5 trays, \$69 each	leg, A4, B5 trays, \$69 each	leg tray, \$89; env feeder, \$89
Replacement supplies							
Toner (price; copies)	NA	\$31; 5,000	\$31; 5,000	\$99; 6,000	\$99; 6,000	\$99; 6,000	NA
OPC (price; copies)	\$129; 5,000	\$235; 10,000	\$235; 10,000	\$129; 10,000	\$129; 10,000	\$129; 10,000	\$129; 5,000
	(OPC and toner)						(OPC and toner)
Other supplies	none	\$245; 40,000 (dev) \$125; 80,000 (luser)	\$245; 40,000 (dev) \$125; 80,000 (luser)	none	none	none	none
Miscellaneous							
Printer emulations	HP LaserJet Plus, Diablo 630	HP LaserJet Plus	HP LaserJet Plus	none	none	none	Diablo 630
Dimensions (LxWxH, in.) ²	19 x 26 x 9	20 x 19 x 18	20 x 19 x 18	13 x 16 x 9	13 x 16 x 9	13 x 16 x 9	19 x 27 x 9
Weight	45 lb	107 lb	107 lb	35 lb	35 lb	35 lb	45 lb
Warranty	90 days	1 yr (90 days on-site)	90 days on-site	1 yr (90 days on-site)	1 yr (30-day return)	1 yr	90 days

*Ratings based on manufacturers' estimates. Actual engine life may vary.

¹Dimensions include paper trays.

²LaCie also includes 84 Casady & Greene downloadable fonts (\$1,000 value).

³Fujitsu's RX7100PS+ offers 4 megabytes of RAM for \$4,995.

⁴AGFA has 13 fonts in ROM, 60 on attached hard disk.

⁵Varityper's VT600W (\$23,000) handles 11-x-17-inch sheets.

PostScript printers now come with at least 2 megabytes of RAM. Higher-resolution devices, such as the 400-dpi AGFA and 600-dpi Varityper, require more memory to handle the greater number of dots they must image on a page. For 300-dpi printers, however, extra RAM speeds

the processing only of documents that contain many different typographic characters. A portion of RAM stores downloaded outline fonts. Most 2-megabyte machines let you download as many as 17 typefaces at once—more than enough for most documents. However, the Fujitsu

printer, despite its 2-megabyte RAM endowment, can handle only seven fonts at once.

If you're not a heavy font user, this limitation won't matter to you. But if you are, seriously consider a printer's download capacity. The RAM in some printers

Camintonn TurboLaser/ PS-PLUS 3	Fujitsu RX7100PS	GCC Business LaserPrinter	IBM Personal Page Printer II	NEC Silentwriter LC 890	QMS PS-820	Ricoh PC Laser 6000/PS	High Resolution	
							AGFA P3400PS	Varityper VT600P
\$5,695	\$4,495	\$4,199	\$4,999	\$4,975	\$6,495	\$4,495	\$12,500	\$17,000
Ricoh 4081	Fujitsu	Ricoh LP-1060	Ricoh LP-1060	NEC LC 800	Canon TX	Ricoh LP-1060	Minolta SP 140	proprietary
laser	LED	laser	laser	LED	laser	laser	laser	laser
600,000	180,000	180,000	180,000	600,000	600,000	180,000	600,000	300,000
Motorola 68000	Motorola 68000	Motorola 68000	Motorola 68000	Motorola 68000	Motorola 68000	Motorola 68000	Motorola 68020	Motorola 68020
12.5 MHz	12.5 MHz	12.5 MHz	16.7 MHz	10 MHz	16.7 MHz	16.7 MHz	16.7 MHz	16.7 MHz
8 ppm	5 ppm	6 ppm	6 ppm	8 ppm	8 ppm	6 ppm	12 ppm	10 ppm
300 dpi	300 dpi	300 dpi	300 dpi	300 dpi	300 dpi	300 dpi	400 dpi	600 dpi
47.1	50.3	49.2	50.5	47.0	47.2	50.5	48.1	48
3 Mb	2 Mb	2 Mb/4 Mb	2 Mb/4 Mb	3 Mb	2 Mb/3 Mb	2 Mb/4 Mb	4 Mb	6 Mb
none	none	optional	none	none	none	none	20 Mb standard	20 Mb standard
35	35	39	43	35	35	35	73°	35
up	down	up/down	up/down	up/down	up/down	up/down	up/down	up/down
16 to 20 lb	17 to 28 lb	16 to 24 lb	16 to 24 lb	16 to 24 lb	16 to 35 lb	16 to 24 lb	16 to 24 lb	16 to 20 lb
1 tray; 250 sheets	2 trays; 150 sheets	1 tray; 150 sheets	1 tray; 150 sheets	2 trays; 250 sheets	2 trays; 200 sheets	1 tray; 150 sheets	2 trays; 250 sheets	1 tray; 200 sheets
ltr, A4	ltr, leg, A4, B5, envs	ltr, leg, A4, A5, B5, envs	ltr, leg, A4, A5, B5, envs	ltr, leg, A4, B5, envs	letter	ltr, leg, A4, A5, B5, envs	ltr, leg, A4, A5, B5, envs	letter**
no	yes	yes	yes	yes	yes (A4, A5, B5)	yes	yes	yes (envs)
none	none	none	none	face-down stacker	none	none	output jogger	none
none	faceup stacker, \$245	compatible w/ Okidata cut-sheet feeder	none	face-up exit tray, \$85	leg tray, \$79; env tray, \$89	face-up exit tray, \$200; aux input tray, \$499	none	leg tray, \$139; A4 tray, \$119; B4 tray, \$139
\$96; 5,000	NA	\$22; 1,500	\$29; 1,500	\$24; 3,000	NA	\$32; 1,500	\$50; 3,000	\$18; 2,000
\$230; 10,000	\$185; 6,000 (OPC and toner)	\$149; 20,000 (w/ cleaning device)	\$199; 20,000 (w/ cleaning device)	\$145; 7,000	\$130; 4,000 (OPC and toner)	\$199; 20,000 (w/ cleaning device)	\$660; 30,000	\$748; 24,000
none	\$15; 30,000 (ozone filter)	\$65; 10,000 (cleaning device)	\$99; 10,000 (cleaning device)	none	none	\$99; 10,000 (cleaning device)	\$60; 30,000 (dev)	\$149; 15,000 (dev)
HP LaserJet Series II, Diablo 630ECS, DEC LN03 family, Tektronix 4010/4014	HP LaserJet Series II	none	HP LaserJet Series II, IBM Proprinter XL	HP LaserJet Plus, Diablo 630	HP LaserJet Plus, Diablo 630, HP 7475A Plotter	HP LaserJet Series II	HP LaserJet Plus, none	Diablo 630
24 x 21 x 13	27 x 16 x 18	16 x 26 x 9	16 x 26 x 8	25 x 19 x 20	28 x 18 x 12	16 x 26 x 8	21 x 21 x 21	21 x 43 x 19
82 lb	44 lb	38 lb	35 lb	68 lb	55 lb	37 lb	102 lb	176 lb
90 days on-site	1 yr (45 days on-site)	90 days	1 yr	1 yr (90 days on-site)	90 days	1 yr (90 days on-site)	90 days	90 days



Illustration created in Swivel 3D by Joe Sparks.

EXPRESS YOURSELF WITH BETTER GRAPHICS

Swivel 3D™ is the best-selling, three-dimensional Macintosh program for anyone who needs high-quality graphics for product design, scientific visualization, animation, and graphics for desktop publishing and multimedia presentations.

Easy to learn and use, Swivel 3D comes with an extensive library of 3D art including alphabets, human figures, robots and additional shapes and figures.

By instantly changing the lighting, casting a shadow, or placing 2D art over a 3D surface, Swivel 3D gives you the freedom to explore all kinds of dramatic possibilities. Quickly and easily.

What's more Swivel 3D works with your other graphic programs because it supports all the popular formats: Encap-

sulated PostScript® for Adobe Illustrator; PICT2 for Studio8; PixelPaint and PageMaker; PICT for MacDraw II; and the animation format — PICS — for MacroMind Director.

Express yourself. Call (415) 543-3848 today.
Ask for a demo disk.



P A R A C O M P

Paracomp, Inc.
123 Townsend Street, Suite 310
San Francisco, Ca 94107, 415-543-3848

Please circle 77 on reader service card.

Those beautiful ideas in your head need to go on the overhead just as beautifully, but your artistic ability or the guy in graphics just won't cooperate.

But the 4693DX Color Image Printer will. It uses a 300-dpi thermal wax process in 16.7 million colors so images and type are bright,

glossy, and very impressive. And it prints on paper or transparencies for presentations, overheads and comps, with infinitely more fiscal responsibility than pricey outside services.

The Tektronix 4693DX. It's the perfect printer to have up your sleeve. Call for the dealer nearest you, 1-800-835-6100, Dept. 1A.



Tektronix®

The best and the brightest.

Magic without the markers.

vestors
X

axable Bonds
Ds
Money Funds

Stocks

AGF Video Game Distributors

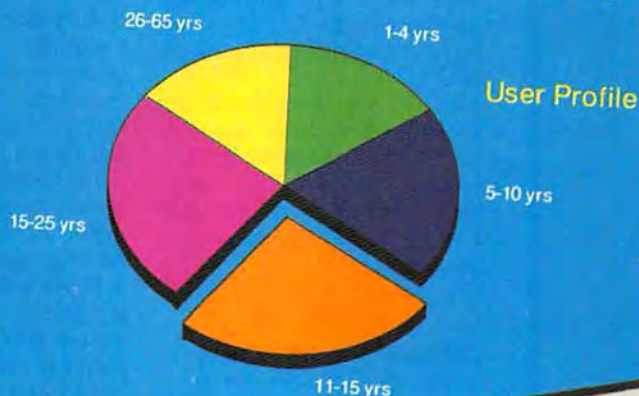
Quarterly Report

HOT GAMES

Nuclear Tornado
Death War
Whiz-Bang Buddies
Armor Snake

NOT SO HOT

Home Wrecker
Solar Sandwich
AtomAge Combat
Blip
Battling Banana Slugs



Copyright © 1989 Tektronix, Inc. All rights reserved. The documents in this ad were created by a blind-folded art director with one hand tied behind his back; Aldus Persuasion; a Mac II; and a Tektronix 4693DX Color Image Printer.

Please circle 171 on reader service card.

Capsule Reviews

The Standards

Most of the PostScript printers we tested are based on the Motorola 68000 microprocessor and offer resolution of 300 dpi and average performance.

Apple LaserWriter IINT

The NT is the second-slowest printer we tested. It prints nice type but suffers a little on gray scale. Priced near the high end of printers in this group (\$4,995), this is a solid machine but not a winner.

Pros: Ultra-easy installation. Very good manual. Toner/OPC change easy and clean. Upgradable to an NTX. **Cons:** Streaky grays. Too expensive. 90-day warranty.

Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010
\$4,995

Camintonn TurboLaser/PS-PLUS 3

Not a particularly high performer (13 percent faster than an NT and costing \$700 more), the TurboLaser has one claim to fame: It's a good machine for use in a multivendor environment. It's the only printer that allows simultaneous connections on its LocalTalk, serial, and parallel ports. It can emulate DEC's LN03 family, as well as the HP LaserJet Series II, Diablo 630ECS, and Tektronix 4010/4014 printers. If you don't need all these emulations, note that Camintonn (formerly a division of AST Research) also offers the TurboLaser/PS, a PostScript-only version that goes for \$4,795.

Pros: Good grays and blacks. Multiport and multiprinter emulation capabilities. Engine life rated at 600,000 copies. **Cons:** Type plugs up. Exposed OPC. Can't handle legal-sized paper, envelopes, or manual feeding. Too expensive. 90-day warranty.

Camintonn Corp.
2332 McGaw Ave.
Irvine, CA 92714-9820
(800) 843-8336 or (714) 553-0247
\$5,895



PHOTOGRAPHY: PETER ALAN GOULD

The standards (clockwise from top right): Camintonn TurboLaser/PS-PLUS 3, Apple LaserWriter IINT, QMS-PS 820, and Fujitsu RX7100PS.

Fujitsu RX7100PS

This LED-array printer performs slightly better than an NT and costs \$500 less, but its overall output quality is not as good. Furthermore, while most printers with 2 megabytes of RAM can handle 17 downloadable fonts, the Fujitsu can deal with only 7. Not recommended.

Pros: Comes with two paper trays. Small footprint. Easy and clean toner change. One-year warranty. **Cons:** Low font-download capacity. Dark grays and blacks print poorly.

Fujitsu America, Inc.
3055 Orchard Drive
San Jose, CA 95134
(800) 626-4686 or (408) 432-1300
\$4,495

GCC Business LaserPrinter

This printer uses the same Ricoh engine that the Ricoh and IBM printers have, but we obtained better grays with this machine. Perhaps Ricoh has a quality-control problem. The GCC had marginally weaker performance than the Ricoh machine, and it costs \$300 less. At \$4,199, the GCC has the best price/performance ratio of all the Adobe-licensed printers we tested, and we've seen street prices as low as \$2,949. GCC offers a SCSI hard disk for font downloading as an option — IBM and Ricoh don't — which boosts performance for heavy font users. It also comes with four additional resident fonts (the Helvetica Condensed family). If you can live with the toner-spillage problem, this is a great buy.

Pros: Great type quality. Excellent price/performance ratio. SCSI hard-disk option. Four extra fonts. **Cons:** Toner spills. No emulations. 90-day warranty.

GCC Technologies, Inc.
580 Winter St.
Waltham, MA 02154
(617) 890-0880
\$4,199

IBM Personal Page Printer II

Uses the same engine as the Ricoh printer, with nearly identical performance, but the IBM version costs \$500 more. It comes with 12 extra resident fonts — from the Garamond, Korinna, Helvetica Black, and Helvetica Light families — above and beyond the 35 standard standard Adobe faces (but it lacks Helvetica Narrow fonts). It emulates the IBM Proprinter XL and HP LaserJet Series II printers. Not a great buy unless you plan to share the printer with DOS machines — or just want to support Big Blue.

Pros: Comes with 43 resident fonts. Excellent type quality. Good performance. DOS-oriented emulations. One-year warranty. **Cons:** Costs too much. Toner spills. Inconsistent gray solids.

IBM Corp.
900 King Drive
Ryebrook, NY 10573
(800) 426-2468 or (914) 934-4488
\$4,999

NEC Silentwriter LC 890

Nearly identical in price and performance to the NT, this LED-array machine was the slowest printer we tested, and it suffers from overall poor print quality. Everything comes out too dark, so type tends to plug up, yet blacks are not solid. Gray solids come out plaid. Not recommended. But NEC has announced the LC 890 XL, which has a 68020 controller and a SCSI hard-disk option. This \$6,995 printer, which should be shipping by now, will address the performance problem. But unless NEC revs the engine, print quality will still be lacking.

Pros: Two paper trays standard. Good toner handling. Engine rated at 600,000 copies. One-year warranty. **Cons:** Slow. Poor print quality.

NEC Information Systems, Inc.

1414 Massachusetts Ave.

Boxboro, MA 01719

(508) 264-8000

\$4,975

QMS-PS 820

Based on Canon's TX engine, with a life expectancy of 600,000 pages (the Canon SX used in Apple's printers is rated at 300,000), the PS 820 outperforms the NT by about 20 percent. But the price/performance ratio on this \$6,495 unit is less than that of the NT. However, QMS will soon ship the PS 820 Turbo (\$6,995) with a 68020 processor and a hard-disk option. QMS claims that the new model will outperform the NTX. The current PS 820 is

too expensive, but the Turbo could be a best buy.

Pros: Two paper trays standard, with DA for tray selection. 600,000-page engine life. Several printer emulations. Easy to set up and maintain. Excellent manual. **Cons:** Pricey. Type too heavy. Uneven gray and black solids. 90-day warranty.

QMS, Inc.

One Magnum Pass

Mobile, AL 36618

(800) 858-1597 or (205) 633-4300

\$6,495

Ricoh PC Laser 6000/PS

This printer performs 15 to 20 percent faster than the NT and costs \$500 less. It has a very good price/performance ratio, but (along with the IBM and GCC printers) it has the messiest toner arrangement of all the printers tested. It's very easy to spill toner inside the printer.

Pros: Excellent type quality. Good performance and price/performance. One-year warranty. **Cons:** Toner spills. Inconsistent gray solids.

Ricoh Corp.

3001 Orchard

Parkway

San Jose, CA

95134

(408) 432-8800

\$4,495



The standards (clockwise from top left): Ricoh PC Laser 6000/PS, NEC Silentwriter LC 890, GCC Business LaserPrinter, IBM Personal Page Printer II.

can be increased to 3 — or, in the case of the NTX, even 12 — megabytes. Adding RAM lets you download more fonts to your printer and increases the size of the font cache as well. But for a 300-dpi printer, it's a rare document that will benefit from more than 3 megabytes of memory, and RAM is expensive.

Another performance enhancement for type fanatics is a dedicated hard disk for fonts. A hard disk has three advantages: It can store hundreds of fonts; it eliminates the network traffic associated with downloadable fonts; and once a font is downloaded to disk, it stays there (downloading to RAM is temporary). A portion of the hard disk is also used as a font cache, which boosts performance even more (see Figure 4).

The high-resolution AGFA and Vari-typer models offer a hard disk as part of their standard configurations. On the NTX, Dataproducts, and ATI printers — all 68020 machines — it's an option. The GCC Business LaserPrinter is the only 68000-based machine that has a hard-disk option. You can expect hard disks to be an option on many more printers in the future. If you use only a few downloadable fonts, a RAM upgrade to 3 megabytes is a good solution. But if you have a large library of type, invest your money in a hard disk instead.

Finally, printer-engine speed affects performance — although not as much as you might expect. Most of the printers we tested, including the NTX, are rated at 6 or 8 pages per minute (ppm). However, the Dataproducts and ATI printers, which are rated at 12 ppm, performed only about 15 percent faster than the 8-ppm NTX. This raises an important point: Ratings of engine speed are theoretical. They represent the maximum possible throughput available on a printer. In practice, throughput is almost always less. It's like the miles-per-gallon ratings given for cars. You never seem to do quite as well as the sticker promised.

Looking Good on Paper

Speed isn't everything. You want your pages to look good too. So how do you judge the quality of a printer's output? Print quality is a function of the printer's engine. Several printers may use the same

Label Software

"That's easy to use."



FastLabel has industry editors talking:

- "Incredible mailing list support."
- "Fast graphic layout."
- "Easy text loading."
- "Full font and style control."

FastLabel \$79.95

TO ORDER 1-800-942-4008

Vertical Solutions • PO Box 7535
Olympia, WA 98507 • 206.352.2097

Please circle 140 on reader service card.

Haven't You Heard the News?



You don't have to buy the whole newsstand to get copies of your latest article or review. Order customized reprints from Ziff-Davis Publishing Co. and let potential clients read all about it.

To find out how you can have your article or review reprinted, contact Jennifer Locke—Reprints Manager, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016, 212-503-5447.

*Minimum quantity 500 reprints.

Capsule Reviews

High-Resolution Printers

These PostScript printers have 68020 microprocessors and a resolution greater than 300 dpi, which produces crisper type, a broader gray scale, and a higher price tag. Hard disks are standard.



High-resolution printers: the AGFA P3400PS and Varityper VT600P.

AGFA P3400PS

The only 400-dpi PostScript printer currently available, the P3400PS produces crisp type that 300-dpi printers can't match, but its gray-scale images come up short. Shading subtly gets lost in both the lightest and darkest shades. It has only 13 resident fonts, but the attached hard disk contains 60 more. Performance is roughly equal to that of an NTX, but it costs nearly twice as much. Our first two units gave us trouble and had to be replaced. Not good, considering it has only a 90-day warranty. Give this printer some time to mature.

Pros: Good print quality and performance. Two paper trays. Has a 20-megabyte hard disk with 60 Adobe fonts. Engine life rated at 600,000 copies. **Cons:** Questionable reliability. Poor gray scale. Doesn't do envelopes. Expensive.

AGFA Compugraphic
90 Industrial Way
Wilmington, MA 01887
(508) 658-5600
\$12,500

Varityper VT600P

Pushing toner technology beyond its limits, the Varityper achieves an output resolution of 600 dpi. Overall print quality is the best of all the printers, but the Varityper is also the most expensive. Performance falls between that of an NT and that of an NTX — not bad considering it's handling four times as many dots per square inch. Not your basic desktop machine for everyday office use, but a good alternative to high-resolution imagesetters for some types of work.

Pros: Excellent type quality and gray scale. Comes with a 20-megabyte hard disk. **Cons:** Too expensive. Has a 90-day warranty. Big.

Varityper
11 Mount Pleasant Ave.
East Hanover, NJ 07936
(800) 631-8134 or (201) 887-8000
\$17,000

engine, so their output will look the same even though their overall designs, and even their performance, may differ.

All desktop PostScript printers initially used laser-based print engines. Today, two new technologies — light-emitting-diode (LED) array and liquid-crystal shutter (LCS) — are used as well (see Figure 5). We tested LED-array print-

ers from NEC and Fujitsu. Each company designed its own engine, and the printers have vastly different output quality. Likewise, the output quality of the laser-based engines varies widely. Only one engine — the Casio LCS 130 of the Qume, Jasmine, and LaCie clones — uses LCS technology. Whether it's the basic technology or the particular engine design,



Macimum Utility

Most of the printers we examined are shipped without software of any note. However, a slew of utility programs that make using PostScript printers faster, easier, and more productive are available from third-party developers.

Spool Tools

No matter how fast your printer is, a spooler makes it seem faster. That's because spoolers reduce the time between initiation of a print job and the instant you can resume work on the Macintosh. The printer doesn't print any faster, but you wait only a fraction of the time it typically needs for it to relinquish control of the computer.

Spoolers are software programs (usually a DA paired with an INIT) that intercept documents to be printed, store them in temporary disk files, and then print them while you continue with your work. This backgrounding ability is how spoolers got their name: Simultaneous Peripheral Operations On-Line.

There's no shortage of commercial spoolers for PostScript and QuickDraw printers alike. SuperLaserSpool, TurboSpool, Grappler Spooler, TangentSpool, and AppleShare Spooler are just a few that leap to mind. With prices typically less than \$100, a spooler can be the least-expensive route to a "faster" printer.

Widgets and Whatnot

MockPackage Plus Utilities from CE Software is an eclectic collection of DAs and utility programs. Of interest to PostScript-printer owners is a handy DA called LaserStatus, which displays the status of the printer currently selected in the Chooser. If you share a laser printer, it lets you see whether it's busy or not before you send a long print job. You can also request detailed information about the printer, such as its PostScript version, page count, font memory, and resident fonts. Not happy with

these fonts? LaserStatus lets you download fonts, PostScript files, or sets of both. Finally, if the printer isn't located next to your Mac, you'll save shoe leather whenever it acts up, because LaserStatus lets you reset the printer remotely. Also provided on the MockPackage Plus Utilities disk is an application called Widgets, which does everything LaserStatus does and lets you disable the printer's self-test startup page. Both LaserStatus and



LaserStatus is a DA that can remotely reset the printer, download PostScript fonts and files, and display printer details.

Widgets are also available with CE Software's DiskTop.

PostScript Programming

When MacUser last evaluated PostScript utilities (see "PS I ♥ You," August '88), Emerald City Software's Lasertalk proved the indispensable environment for serious PostScript programming and debugging. Its interactive mode provides immediate feedback from the PostScript interpreter as commands are sent to the printer. Post-ility, from PostCraft International, shines in its ability to manipulate EPS files and paste commonly used code with its Glossary function. On the low end, PostHaste, from Micro Dynamics, is a bare-bones utility that lacks good debugging tools but might be worth a look if you don't want to spend a lot of money to get into the PostScript programming game.

— Owen W. Linzmayer



MiniCad+™

Let Others Speak for Us

"Congratulations to everyone involved in producing MiniCad+. Combined with the MiniCad Plotter driver, this is definitely a System for design, drafting, analysis, and production of drawings on the Macintosh. The add-ons like macros, on-screen spreadsheet, hierarchical symbol editing and other improvements amount to a professional CAD program presented in a well documented manual, which I was glad to see in binder form...I have investigated other CAD programs...notably VersaCad and I don't think any of these have any advantage over MiniCad+. In terms of options and attributes MiniCad+ definitely has an edge over all others."...B. St-Jean, National Museum, Canada

"MiniCad+...is in our opinion, in power per dollar the best CAD program for the Mac...I think one of the best new features is the MiniPascal command language."...John S. Gates, AIA

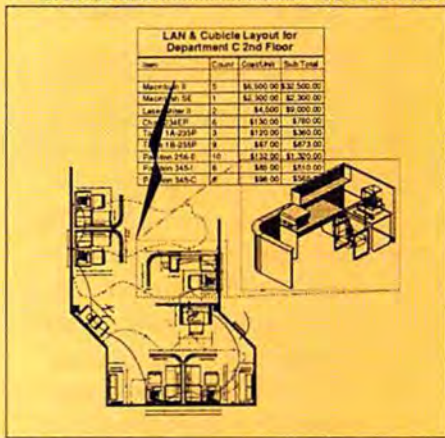
"I have been using MiniCad+ for some weeks now and I must say it is a fantastic improvement on the last release of MiniCad. I particularly like the new 3D features which are easier to use"...Andrew Herron, Herron Associates

Act now Only: \$695
Demo: \$19.00

- Mastercard & Visa accepted
- Call or write today to order:

Graphsoft • 8370 Court Ave., Ste. 103A,
Ellicott City, MD 21043

- In USA: 301-461-9488
- In Canada: 604-380-6911
- In Australia: 61-7-369-1204



Graphsoft

Macintosh Plus, SE, II & IIX are trademarks of Apple Computer Inc.

Please circle 84 on reader service card.

WHY MORE PEOPLE WILL BE BUYING MACINTOSH PRODUCTS...

For dealers only. MacUser magazine and Ingram Micro D have joined forces to offer resellers the *Macintosh Pocket Selling Guide*. It's a pocket-sized reference guide packed with everything a salesperson needs to better explain today's advanced Mac Products.

Some of the Guide's features include:

- A complete listing of MacUser's highly-respected MiniFinders. These capsule reviews have long been used by retailers to guide buyers in their product purchase decisions.
- A complete industry directory that lists support information for every Macintosh vendor.
- A complete glossary that defines many of the commonly-used terms in the Macintosh market.

More power to you.

The most powerful part of the PSG is the "Sales Briefs." Eye-catching pages that summarize the most important facts about individual products, enabling a salesperson to quickly pass on vital information to potential buyers. You'll make more sales using the "Sales Briefs."

If you would like more information about the MacUser/Ingram Micro D *Pocket Selling Guide*, contact Ingram Micro D.

we can't say, but the overall output quality of this engine is excellent.

What should you look for when judging a printer's output quality? Type is probably what most people are concerned about, because it dominates the majority of printed pages. To test type quality, we printed some 6-point text in Times Bold Italic and examined it under a magnifying glass.

You hope to see crisp, clean lines, with all the letters legibly formed. Some manufacturers, including Canon, which provides the engines for Apple's LaserWriter IIs, design their engines to produce strong, solid blacks. But this often makes type print too heavily, making everything appear slightly too bold. In extreme cases, type plugs up or letters

jam together. The Camintonn TurboLaser and NEC Silentwriter are particularly prone to this problem.

If you plan to print halftones or to create images that contain large, solid areas of gray, be sure to check a printer's gray scale. By using default settings, you can get 300-dpi printers to produce 33 shades of gray, including white and black. We printed a gray-scale strip to see if each of the 33 shades was distinguishable from its neighbors. We also checked to make sure the strip showed an even distribution of grays, without being shifted toward the dark end, which sometimes occurs with printers that are designed for blacker blacks.

Finally, we performed a streak test. That is, we printed a solid page of each



Toner: No Deposit, No Return?

I used to be puzzled whenever I saw a diesel Mercedes-Benz sedan on the highway. Why would anyone who could afford a luxury car worry about the price of fuel? Similarly, I often wondered why some owners of expensive laser printers would go to the trouble of having their toner cartridges refilled. A little investigation reveals that the benefits can be substantial.

Lower cost is the main reason people turn to refilled toner cartridges. A new cartridge for the LaserWriter II retails for \$129, yet a refurbished unit goes for only about \$60. Throughout the life of the printer, buying second-hand cartridges can save you thousands of dollars.

The trick to reusing your toner cartridges is finding a reputable remanufacturer. Some of the low-price leaders in the field operate "drill and fill" houses, which, as the name implies, simply drill a hole in your old cartridge, empty out the spent toner (hopefully), and pour new toner in through a funnel. Patronizing these refill-only firms can be troublesome.

Despite the word *toner* in their names, the most popular cartridges (including the EP cartridges of the Canon CX engines and the EP-S cartridges of the SX engines) contain more than just the black "ink" that sticks to the paper. The primary components are the toner reservoir, transfer mechanism, photo-static drum, corona wires, and waste reservoir. A good cartridge remanufacturer — as opposed to a simple refiller — completely disassembles the cartridge, checks each part for wear, and lubricates the pieces.

In the long run, it's wear and tear on the drum that determines the life span of a toner cartridge. Even under the best circumstances, the coating on the drum wears out after several refills. By insisting on getting back the same cartridge you sent, you'll know exactly how many times your cartridge has been refilled. However, if your remanufacturer has good quality control, this shouldn't be a concern. Also, a relatively new process allows drums to be recoated for about \$10, essentially allowing infinite refills.

In any case, the firm should provide a test sheet printed with the refurbished cartridge and unconditionally guarantee its work against defects. The most common problems we've found with refilled cartridges are occasional black streaks on paper, overly light or dark printing, and toner leaks inside the printer. These symptoms indicate a poor job and should be your cue to switch remanufacturers.

Some proponents claim that, properly refurbished, used cartridges can actually be better than new ones. Because the drum has already been broken in, print quality is more consistent, and blacks print blacker. Furthermore, Canon recently began using an abrasive in its toner that's presumably designed to destroy the drum, making it impossible to reuse EP-S cartridges. All the more reason to buy refurbished, not new. Although some purists adamantly refuse to use refilled cartridges, the substantial cost savings involved seems to outweigh any charges leveled against them so far.

— Owen W. Linzmayer

Table 2: Toner Refills Save Money

	Engine	Cartridge	Maximum number of copies	Recommended number of refills	Lifetime savings
LaserWriter	CX	EP	3,000	3 to 7	\$5,160
LaserWriter II	SX	EP-S	4,000	2 to 4	\$4,140

Refilling toner cartridges can be easy on the pocketbook. Savings are based on a printer life expectancy of 300,000 copies, cartridges' providing maximum copies, refilling the number of times recommended, and prices of \$119 to \$129 each for new cartridges and \$60 for refurbished ones.

of several shades of gray, concentrating on values that are close to white or black. Some engines produce very smooth, even grays across the entire page. Others — the Canon SX engine in the LaserWriter IIs, for example — display one or two large streaks. Some (notably the NEC Silentwriter) create something resembling a Scottish plaid. We also checked to see whether a full page of black printed solidly or contained gray splotches.

Most printers do well on some of these tests but not on others. The NEC Silentwriter, sadly, does poorly on all of them. This printer is a prime example of the problems that can result from putting the desire for solid blacks above all else. Everything the Silentwriter prints is too dark, but it still produces less-than-optimal blacks.

Two engines performed with flying colors on all the output-quality tests: the Casio LCS 130 (used in the clone printers) and the Varityper, with its 600-dpi resolution. These engines are found, respectively, in the least- and most-expensive of all the printers we evaluated. For examples of good and bad quality of gray scale and type, see Figure 6. We can't reproduce the streak and solid-black tests here, but you can try them yourself when you're comparison shopping.

Ease of Use

All the printers we tested are fairly simple to set up and use, although they vary widely in their approach to toner replacement. All offer easy access to the paper path, making it easy to clear paper jams. The LaserWriter IIs — the NT and NTX are identical, Canon engine and all, except for the controller board — are the easiest of all to set up. No big surprise there, since Apple's stock-in-trade is ease of use. The QMS-PS 820, which also

uses a Canon engine, is also a snap.

The only printer that gave us any setup trouble worth mentioning was the Camintonn TurboLaser. To install or replace its toner and optical photoconductor (OPC), you have to pull on the front panel of the printer. The problem is, you really have to give it a jerk — pulling demurely doesn't work. You get this sinking feeling that you're about to snap the plastic just before the panel finally gives.

Setup is one thing. What about when there's a problem? All the printers provide front-panel indicators or controls. The LaserWriter IIs have the simplest panels, with four LED indicator lights and associated icons. Some of them are clear enough to be proposed as international symbols; others defy interpretation. The Dataproducts and ATI printers offer the most elaborate setup, with extensive touch pads and LCD panels for status messages — it looks like you could fly a jet with them. (To be fair, they're well marked and easy to understand.) The panels on the LaserWriter IIs only indicate status, but the Dataproducts and ATI printers, along with many of the other machines, let you control certain aspects of the printer's behavior from the front panel. You can turn the startup page on or off, for example. If the printer has two trays, you can select which one to use.

There's a lot of variation here, but don't base your buying decision on the front-panel controls. If the printer is networked, you're not likely to see the status lights anyway. And even if some of the controls are a bit cryptic, typically only a few people in a work group mess with a printer in distress. They'll quickly learn their way around, and that will be that.

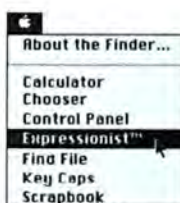
A more significant issue is the printer's paper-handling capability. All of these machines can print on letter-sized paper,

Equations Made Easy

with

Expressionist 2.0

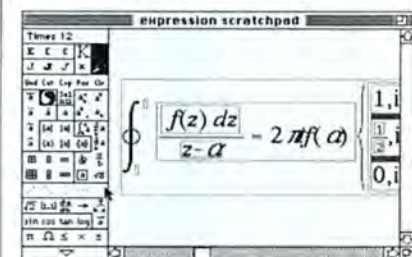
The Personal Mathematical Equation Editor



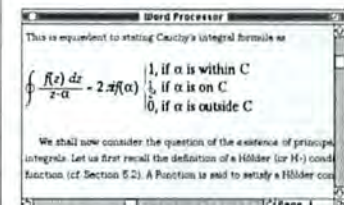
"The first version of Expressionist was wonderful; the second is nirvana."

— MacUser magazine, November 1988

1.) Select the DA ...



2.) Create your equation ...



3.) Copy & paste into your word processor!

and get

Results like this:

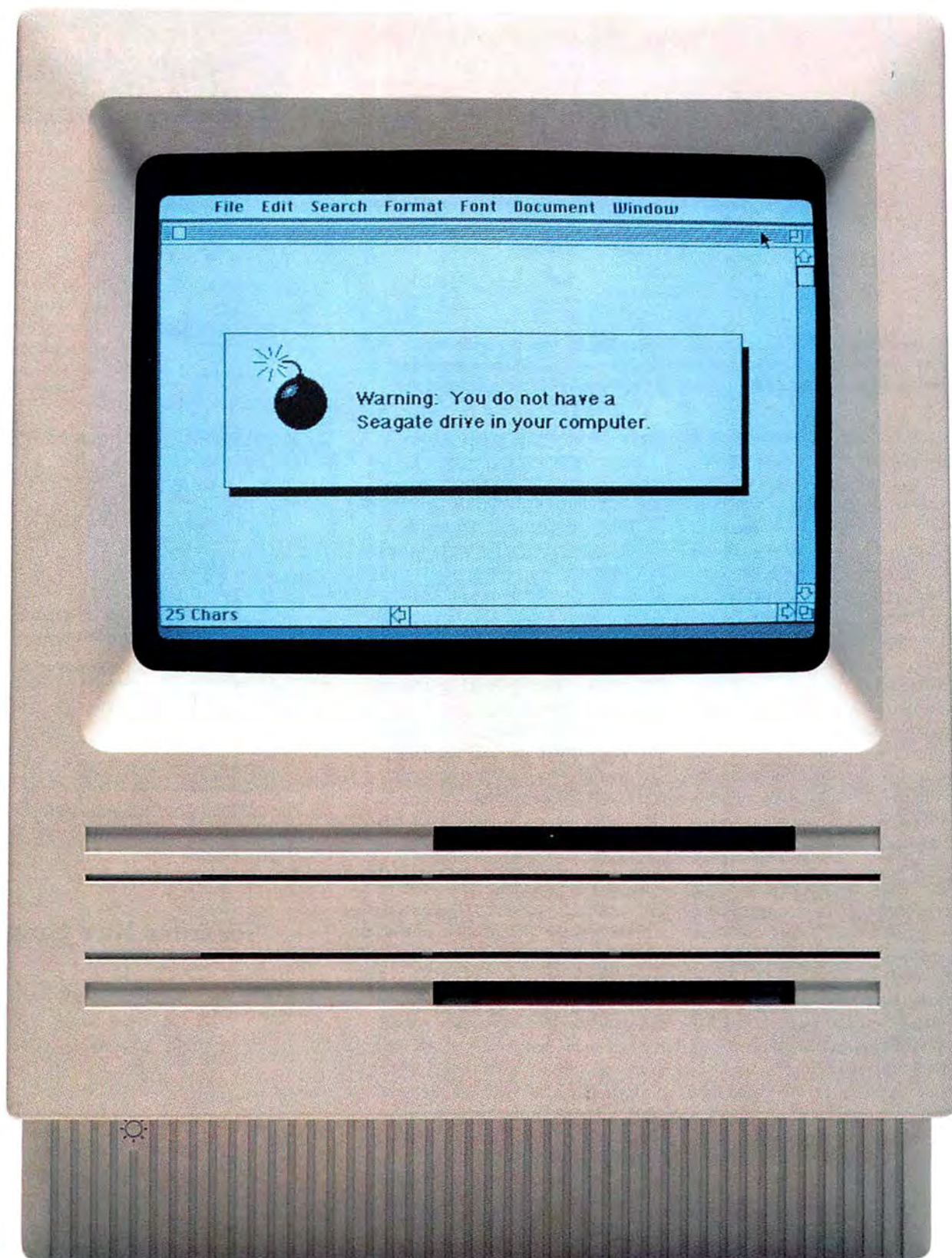
$$\nabla^2 E - \frac{\mu \epsilon}{c^2} \frac{\partial^2 E}{\partial t^2} = 0$$

$$\nabla^2 B - \frac{\mu \epsilon}{c^2} \frac{\partial^2 B}{\partial t^2} = 0$$

$$\operatorname{erfc} \left(\frac{|z_1 - z_2|}{\sqrt{2} \sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}} \right)$$

Send \$129.95 for the complete package, or for a brochure and more information write to:
allan bonadio associates
814 Castro Street #91
San Francisco, CA 94114
(415) 282-5864

Please circle 61 on reader service card.



Don't take chances. Ask for Seagate.

 **Seagate**
The first name in disc drives

and most can handle legal-sized paper, envelopes, and manually fed sheets. The clones don't support manual feeding or envelopes, and the Camintonn Turbo-Laser is even worse — it can't handle envelopes, manual feeding, or legal-sized paper.

Some printers have only one slot for a paper tray; others have two. Of those with one slot, some (Apple, Varityper, and the clones) require you to change trays to switch from letter- to legal-sized paper, and you must buy the second tray. The IBM, Ricoh, and GCC printers each have one universal, adjustable tray. The Data-

products and ATI models come with a single tray, but you can add a dual-input cassette, which gives you a total of three trays, for a hefty \$895. The AGFA, Fujitsu, QMS, and NEC printers come standard with two trays.

Then there are fonts. Most of the printers come with the same 35 Adobe fonts (11 typeface families) that the LaserWriter IINTX has. The clones use Bitstream equivalents. The GCC and IBM printers throw in a few extra fonts, but the high-end AGFA offers 73 fonts (60 of them on its hard disk). The LaCie Panther PDX — already our cheapest printer —

has an especially sweet deal: 84 Casady & Greene fonts worth \$1,000.

In other words, there are nearly as many configurations as there are printers. If this is an important consideration, check the features listed in Table 1. If you have any doubts, grill the salesperson to make sure that the printer you buy meets your needs. Our recommendation for a two-tray printer: the QMS-PS 820.

Conspicuous Consumption

Printer engines have several parts that must periodically be replaced. These include the toner reservoir; the OPC; and,

Capsule Reviews



The Clones

These three PostScript-compatible printers are identical except for their names. Although they don't have Adobe-licensed PostScript interpreters, they are fast and offer excellent print quality.

Qume CrystalPrint Publisher

The only shipping, 300-dpi, black-and-white PostScript clone (except, of course, for the LaCie and Jasmine machines, which are identical). Based on a RISC microprocessor, this printer is a screamer. Its overall performance is 1.4 times that of an NT, but it costs \$500 less. Even at \$4,499, it's among the least expensive of all the printers we tested, and the street price is as low as \$3,495, the same as that of the other clones. The engine's liquid-crystal-shutter technology produces excellent overall output quality. In sum, it offers a great price/performance ratio — except when printing documents that contain downloadable fonts. Stick to the 35 resident Bitstream fonts to avoid compatibility problems; we had problems with some downloadable Bitstream fonts. The clones can't use Adobe-style fonts at all, making them of questionable value as proofing devices for high-resolution output. At press time, the clones also didn't work with the new LaserWriter driver (version 6.0).

Pros: Fast and inexpensive. Few compatibility problems. Excellent gray scale and solid blacks. One-year warranty. **Cons:** Doesn't support the Adobe type library. Small paper tray. Doesn't allow toner refill more than three times without requiring OPC replacement. No manual feed and won't do envelopes. No emulations.

Qume Corp.
500 Yosemite Drive
Milpitas, CA 95035
(800) 223-2479 or (408) 942-4000
\$4,499



The clones (clockwise from left): LaCie Panther PDX, Qume CrystalPrint Publisher, and Jasmine DirectPrint.

Jasmine DirectPrint

Identical to the Qume CrystalPrint Publisher, except for the manual (which is not as thorough), the price (\$1,000 less), and the label on the front. Along with the LaCie, it has the lowest price and best price/performance ratio of all the printers we tested.

Jasmine Technologies, Inc.
1740 Army St.
San Francisco, CA 94124
(415) 282-1111
\$3,495

LaCie Panther PDX

This printer costs the same as the Jasmine, and both are identical to the Qume CrystalPrint Publisher. However, LaCie includes in that price 22 volumes of Casady & Greene typefaces — 84 fonts in all, a \$1,000 value. This gives the Panther a slight edge.

LaCie, Ltd.
16285 S.W. 85th, Suite 306
Tigard, OR 97224
(503) 684-0143
\$3,495

See Qume at Macworld, Aug. 10-12, Booth #1906,
Bayside Expo Center

So Fast, Your Imagination Will Soar.

Qume CrystalPrint Publisher™

The Publisher desktop printer is fast. Blazing fast. Faster than any other page printer in its class. That means your best, your most complex PostScript® documents are in your hands in seconds. Not minutes.

Your imagination isn't kept waiting or wanting. Because the Publisher delivers eye-dazzling, laser-crisp print from your PostScript applications. With graphics composed of fine lines, solid blacks and smoothly graduated grays. And layouts with precisely formed text. The result — elegant images not even Apple®'s top-of-the-line LaserWriter™ II_{NTX} can match.

The Publisher's price will capture your imagination, too. It's amazingly low. You get the power of the LaserWriter II_{NTX} for less than a LaserWriter II_{NT}. And that's a very big difference.

Plus, whether your preference is for Macintosh™ or IBM™ — no matter. CrystalPrint Publisher will send you to new heights in either world.

Call 1-800-223-2479 for more information, or the location of the Qume dealer nearest you. Don't wait. Let your imagination soar. See the Qume CrystalPrint Publisher today.



"Best
New
Output
Device"

1989 MacUser
Magazine
Editor's Choice
Award

Qume®

The Company with Peripheral Vision.

©Qume Corporation, 1989. Qume and the Qume logo are registered trademarks of Qume Corporation. CrystalPrint Publisher is a trademark of Qume Corporation. Apple is a registered trademark and LaserWriter and Macintosh are trademarks of Apple Computer, Inc. IBM is a trademark of International Business Machines Corp. PostScript is a registered trademark of Adobe Systems, Inc.

Please circle 178 for information
Please circle 179 for dealer inquiries



in some engines, the developer and fuser. (For an understanding of what these parts do, see Figure 5. To compare the cost of ownership, see Figure 7.)

Some of these parts need to be replaced sooner than others. Toner is usually the first to run out. It's also the cheapest to replace. For this reason, many engine

manufacturers let you replace the toner independently of the other consumables. This approach is cost-effective because you don't throw away other parts that are still usable.

In most engines with separate toner replacement, however, you risk making a big mess. For example, when you replace

toner on the Ricoh LP-1060 (used in the Ricoh, IBM, and GCC printers), you must lay the container in the printer and use a crank to remove a plastic strip from the bottom of the container. Nothing indicates when you've cranked the plastic all the way back, though. If you remove the container before the plastic's all off —

Capsule Reviews

High-Performance Printers

A Motorola 68020 microprocessor gives these PostScript printers their blazing speed, and they offer optional hard disks.



PHOTOGRAPHY: PETER ALAN GOULD

High-performance printers (clockwise from left): ATI LaserPrint 1275, Dataproducts LZR 1260, and Apple LaserWriter IINTX.

Apple LaserWriter IINTX

An excellent printer. The optional SCSI hard disk for font downloading — the NTX was the first 300-dpi PostScript printer to offer this feature — makes it a great DTP workhorse. One of the highest-performance machines we tested, it's an ideal choice for a network of users who generate a high volume of printed pages. Upgradable to 12 megabytes of RAM, but don't waste your money. Stick with the standard 2 megabytes and invest in a hard disk instead. A market leader, the NTX will soon have competition that both under-sells and outperforms it.

Pros: Reliable, high-quality printer with great performance. SCSI-drive option.

Cleanest toner-changing system around. Easy installation. Good manual. **Cons:** Streaky solids, splotchy blacks. 90-day warranty. For support, don't call Apple, call your dealer — need we say more?

Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010
\$6,999

Dataproducts LZR 1260

Like the NTX, a great machine. Unlike the NTX, an industrial-strength machine, with multibin options and an imposing footprint. Its Toshiba engine is rated at 12 ppm, 50 percent

faster than the Canon engine in Apple's NTX. In practice, it was only 15 percent faster — but that was enough to make it the fastest printer we tested. The LZR's type is a little heavy, but it has good grays and blacks. A hard disk is available, which we recommend for anyone using lots of fonts. The extensive control panel includes an LCD status display and the ability to switch the startup page on and off. The engine life is rated at 600,000 copies (the NTX engine is rated at 300,000), and it has a one-year warranty (Apple gives you 90 days). Worth \$1,000 more than an NTX? We'd call it a tie.

Pros: Fastest performance of all the printers tested. Hard-disk option. Dual-input trays available. Smooth grays and solid blacks. Good manual. Toner change easy and clean. One-year warranty. **Cons:** Envelope and manual feeding a little on the touchy side. Overall dark output results in heavy type. Big.

Dataproducts Corp.
6200 Canoga Ave.
Woodland Hills, CA 91365
(818) 887-8000
\$7,995

ATI LaserPrint 1275

Identical to the Dataproducts LZR 1260. ATI buys the machine from Dataproducts and resells it with a new label; it even comes with a Dataproducts manual. But ATI sells it for \$600 more, and offers only a 90-day warranty. End of subject.

Advanced Technologies International
355 Sinclair-Frontage Road
Milpitas, CA 95035
(408) 942-1780
\$8,595



disaster. Even when we cranked the plastic back all the way, some toner spilled inside the printer virtually every time.

Some engine manufacturers have put a great deal of thought into this problem, giving you the cost advantage of separate toner replacement but designing it to eliminate spills. The Toshiba engine in the ATI and Dataproducts printers is an example of good design, as are the Ricoh 4081 in the Camintonn TurboLaser, and the engine in the NEC Silentwriter.

In engines that require separate replacement of the OPC, you must be careful because it's highly light-sensitive. You can destroy the OPC by exposing it to bright light or by touching it. Most printer manufacturers position the OPC out of sight inside the printer, so that

unless you explicitly remove it, you don't risk damaging it. With the Camintonn TurboLaser, however, it's in plain view every time you open the printer lid. Very poor design.

Some engine manufacturers seal all replacement parts inside a single cartridge, so you never risk a close encounter with the toner or OPC. The Canon engines (Apple and QMS printers) and the Fujitsu printer's engine are designed this way. These are simple to replace — open lid, remove cartridge, insert new cartridge, close lid. While clean and easy, this approach significantly increases the cost per page. Every time you run out of toner, you must replace the not-yet-worn-out and more-expensive OPC as well.

Some people save money by recycling

their OPC/toner cartridges, trading in the empties for refilled ones (see the "Toner: No Deposit, No Return?" sidebar). Others go even further and refill their own cartridges, which really reduces the cost.

The Clones

Life is full of hard choices — such as whether or not to buy a PostScript clone printer. Adobe, of course, would like the clones to go away. But they won't. We're not going to discuss the ethics, morality, or legality of clones, although they make interesting dinner conversation. Instead, we'll investigate the issue from a user's perspective.

The first thing to say about the clones we tested (Qume, Jasmine, LaCie — same printer, different labels) is that each one's

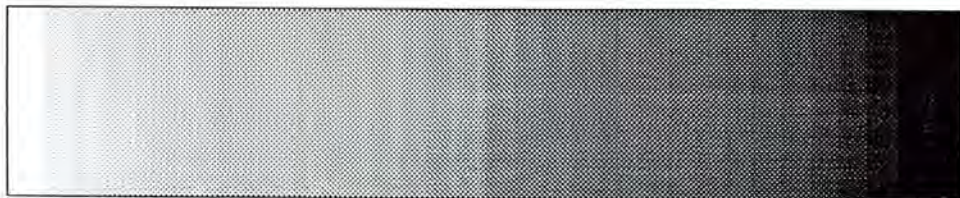
Figure 8: The Good, the Bad, and the Hi-Res



Good

*When in the course of
human events, it becomes
necessary for one people*

When in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare



Bad

*When in the course of
human events, it becomes
necessary for one people*

When in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare



Hi-Res

*When in the course of
human events, it becomes
necessary for one people*

When in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare

Output quality falls into two broad categories: type and graphics. Shown here are three type samples (6-point Times Bold Italic) and three gray-scale strips. There's one example each of the best and worst from the 300-dpi printers, plus 600-dpi samples for comparison. Keep in mind that our descriptions may not match what you see here, because it's extremely difficult to reproduce the fine details on an offset press.

The Good: All the letters are highly legible in the type sample. There are small gaps in some of the characters, but they are not apparent to the naked eye and contribute to legibility. The gray-scale strip has a smooth gradation from white to black. Both samples were output on the Casio LC-130 engine of the Qume clones.

The Bad: The type appears too bold, and the small holes in letters such as the lowercase *e* are plugged up. This sample came from the NEC Silentwriter. In the gray-scale strip, printed on a LaserWriter IINTX, each shade of gray isn't distinct from its neighbors. The Canon SX engine in the NTX also has a bad streaking problem.

The Hi-Res: These samples were printed on Varityper's 600-dpi printer. Not surprisingly, both type and gray scale look excellent. Distinct bands are not visible in the gray-scale strip because the higher resolution lets the printer generate too many shades of gray for the eye to pick up.

THE FIRST GRAPHIC SPREADSHEET.
THE LARGEST, FASTEST AND MOST VERSATILE SPREADSHEET EVER.

WINGZ™

“Wingz has more features than any Macintosh or DOS spreadsheet on the market, but is easy to use and learn.”
—MacGuide

“Wingz towers over Excel.”
“Wingz is fast. Faster than Excel or Full Impact.”
“The most extensive graphing capability of any current Mac program.”
—MacWeek

“If you use Excel, you'll be up and running with the \$399 Wingz almost immediately—the learning curve is not an obstacle to upgrading to it.”
“You get total control over visual elements of the spreadsheet... it produces graphs that are nothing short of awesome.”
—Newsday

“Wingz is a nice replacement for Excel.”
“Go for the gold and purchase Wingz.”
—InfoWorld

“The most exciting piece of software I've ever used on the Macintosh...Wingz opens up virtually the whole of the Macintosh box of tricks.”

“Wingz is as significant in its own way as MacPaint and HyperCard.”
—MacUser U.K.

MACUSER RATING
WINGZ ★★★★★

Available now for Apple® Macintosh® computers.

TO FIND A WINGZ DEALER NEAR YOU CALL (800) 331-1763, EXT. 1000

INFORMATION MANAGEMENT SOFTWARE FROM INFORMIX®

Copyright © 1989 Informix Software, Inc. Informix and HyperScript are registered trademarks and Wingz is a trademark of Informix Software, Inc. Apple, Macintosh, MacPaint and HyperCard are registered trademarks of Apple Computer, Inc. Microsoft is a registered trademark. Full Impact is a trademark of Ashton-Tate Corporation.

Please circle 197 on reader service card.

performance is excellent, about 1.4 times that of a LaserWriter IINT. If this weren't true, they wouldn't pose such a threat to Adobe PostScript printers. We've heard rumors that other soon-to-be-released clones may run *seven* times faster than an NT. We'll see.

The second thing to say about the clones is that they're cheap—these are the least-expensive printers we tested. And the third thing is that they have excellent output quality.

But then comes the question of the clones' compatibility with PostScript. To test compatibility, you could devise PostScript code heavily laden with obscure PostScript operators to see if the interpreter in the printer does what the Red

Book says it should. (The Red Book, officially entitled *PostScript Language Reference Manual*, describes the PostScript language and how its various operators, or commands, are supposed to behave.) Alternatively, you could try printing a bunch of files from commonly used Macintosh applications to see if any problems arise. We chose the latter approach, printing a variety of complex text and graphics files.

Although we had generally excellent results, there were two files that the clones couldn't print. One was a gray-scale image printed from DataCopy's MacImage scanner software. We got different results on different test runs: Sometimes we got a single band of the image across the page,

sometimes several bands, sometimes nothing. The image printed perfectly when it was opened with Digital Darkroom or imported into PageMaker instead. The second unprintable file was our MacDraw test file, which contained hundreds of ovals. This file simply overloaded the clones' memory.

After some work in the back room, Qume confirmed that we had, indeed, located a bug in its printer's ROM. An upgrade (version 3.0) should be available by now; take the printer to your dealer or send it to a service depot. The upgrade also fixes a problem previously discovered with some fonts at sizes smaller than 12 points, and it adds the Helvetica Light, Light Italic, Black, and Black Italic families to the printer's ROM. In addition, you get a coupon for the Bitstream Mac-Fontware package of your choice. Not a bad deal.

In all fairness, we should point out that the Camintonn TurboLaser didn't successfully print all the test files either. In particular, it choked on the Adobe Separator files. Camintonn said that Adobe was supplying new ROMs with this bug fixed. Owners of Camintonn printers with buggy ROMs can request the new, user-installable ROMs, which are free.

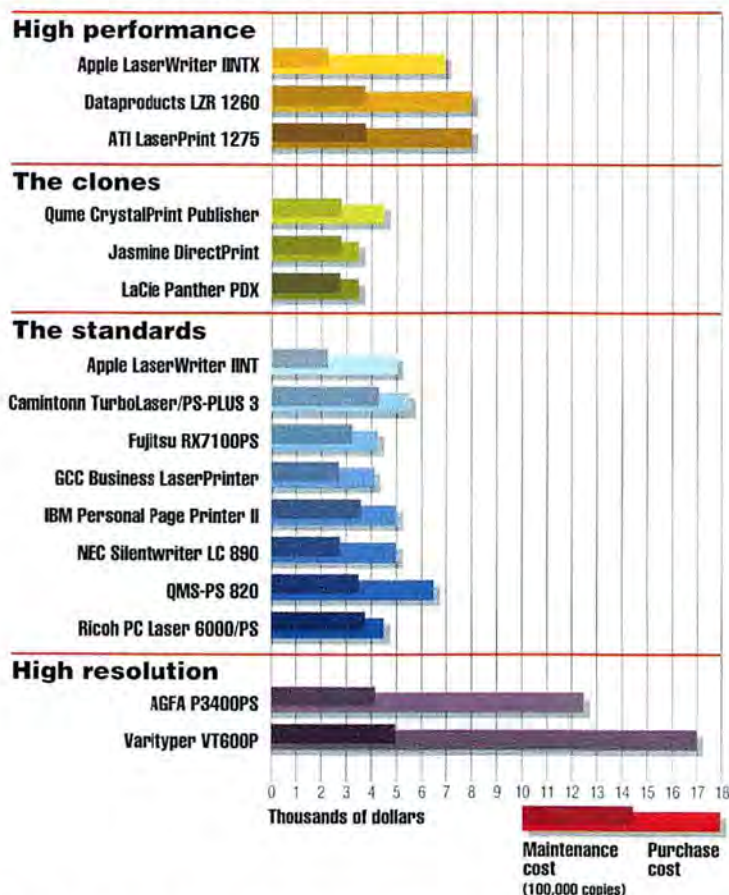
As we went to press, we discovered, much to our chagrin, that the clones wouldn't print at all with Apple's new LaserWriter driver. Qume was unaware of this (!), and while the company assured us the problem would be corrected, it couldn't say when.

Based on our experience, PostScript compatibility doesn't appear to be a serious problem with any of the clones, if—and you'll have to decide for yourself how big an if this is—you stick to the 35 resident fonts.

Font Frenzy

Based on their price, performance, and output quality, the clone printers sound dressed for success. But there is a caveat, and it's a significant one. Most PostScript printers—and the clones are no exception—have the same 35 typefaces stored in ROM. They're always there, and you can always use them. In Adobe PostScript printers, these typefaces come from Adobe; in the clones, they come from

Figure 7: Cost of Ownership



PostScript printers can be pricey propositions, and purchase price alone doesn't tell the whole story. The cost of replacement parts—toner, OPC, developer, cleaning devices—adds up to thousands of dollars over the lifetime of a printer. This graph shows the maintenance costs for the first 100,000 copies; life expectancies of the engines vary from 250,000 to 600,000 pages.

THE FIRST GRAPHIC SPREADSHEET. THE LARGEST, FASTEST AND MOST VERSATILE SPREADSHEET EVER.

FREE WINGZ™ WEAR



WINGZ
WORLD TOUR '89

WINGZ™

FOR A LIMITED TIME ONLY.

Buy Wingz for the Macintosh® and get the Wingz World Tour black satin jacket free.*

For more information visit your Wingz dealer or call 1-800-331-1763, extension 1000.

*Available in the U.S. only, certain other limitations apply.

INFORMATION MANAGEMENT
SOFTWARE FROM INFORMIX®

Please circle 198 on reader service card.

Copyright © 1989, Informix Software, Inc. Wingz is a trademark and Informix is a registered trademark of Informix Software, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc.

Bitstream. Most of our tests used only these 35 fonts, as do more than 90 percent of all documents printed on PostScript printers. If you're planning to do likewise — *if you never intend to use any fonts other than the 35 resident ones* — compatibility should not pose a problem with the Qume/Jasmine/LaCie clones.

But both Adobe and Bitstream have type libraries containing hundreds of other downloadable typefaces. Many other companies also produce fonts that work on both PostScript and clone printers. Although fonts from Bitstream and other third parties work on Adobe PostScript printers, the Adobe fonts don't work on clone printers. Adobe's font information is encrypted, and the clones just can't decipher it.

Simple, you say; just get the Bitstream fonts. Not so simple. For as-yet-unexplained reasons, the clones — otherwise

excellent performers — slow to a crawl when printing documents containing downloadable fonts. The eight-page PageMaker document we used in testing, which contains six downloadable fonts, took 18.5 minutes to print on the clones, using Bitstream fonts, compared with only 8 minutes for the NT, using Adobe fonts.

If you're printing only to your local printer, font compatibility may not matter. If, however, you plan to print your final pages on a Linotronic (or other high-resolution imagesetter), you should know that most Lino operators have standardized on the Adobe type library. They don't have Bitstream fonts. That may change, but it remains to be seen whether service bureaus will see the addition of the Bitstream library as a welcome opportunity or as an unwarranted expense. (For a more comprehensive discussion of fonts, see "Fonts from A to Z" elsewhere in this issue.)

What does this mean to you? If you're going to use your clone as a proofing device for Lino output and you plan to use downloadable fonts, you should be extremely careful. The chances are good that you will run into compatibility problems. For this reason, unless you know *for certain* that the fonts you use will be available on the printer on which you print the final output — and you can always provide them yourself, if the folks who run the Lino are willing — we don't recommend the clones for font-intensive DTP work with high-resolution output. And, because of performance problems, we don't recommend using them with downloadable fonts at all.

Decisions, Decisions

As you can see, many, many factors affect your choice of PostScript printers. Remember, start by figuring out what you plan to do with the printer, both now and in the future. If you're not going to do halftones or use gray type or large, solid-gray areas in drawings, don't worry about how the gray-scale tests came out. If all you plan to do is print spreadsheets, look at the performance chart (Figure 3) to see which printer did best on the Excel test.

Although we found the LaserWriter IINTX, the clones, and the QMS and

GCC printers to be the best of the lot, your needs may point you in a different direction. If high resolution is what you need, for example, check out the Varityper VT600P. And keep your eyes open. By the time you read this, NEC and QMS will have new models on the market, and these are just the ones we know about.

Finally, one more thing that bears repeating. In May, Apple announced its own outline-font technology, which will enable Macs to display high-quality type and print it to both PostScript and non-PostScript printers. (Apple will provide a core set of fonts; it hasn't said which ones, but the basic 35 seems like a good guess. The rest will come from third parties.) Meanwhile, Adobe has announced the Adobe Type Manager, which will let you use PostScript printer fonts to display high-quality type on the Macintosh screen.

When Apple's and Adobe's products ship sometime in 1990, they will completely change the terms of the QuickDraw versus PostScript debate. How they'll change, we can't tell you, and what it will mean for the clones is anybody's guess. Does that mean you should be wary of buying a PostScript printer? Not until Apple stops selling them — and that day, if it ever comes, is a long way down the road.

Henry Bortman wrote *MacUser's* first comparison of PostScript printers (October '87) and its evaluation of the LaserWriter II family (May '88). He appears unable to leave the genre, a fact of life that he likes to pretend disturbs him. Senior Editor Aileen Abernathy is completing her grand slam of major Mac peripherals, which began with color monitors (October '88) and gray-scale scanners (June '89).



Late Arrivals

A few printers were released too late for us to test. The QuadLaser PostScript (\$5,295) from Quadram (Norcross, Georgia) is a standard PostScript printer that offers the requisite 35 resident fonts and 3 megabytes of RAM. NewGen Systems (Santa Ana, California) has two high-performance clone printers that it claims are more than twice as fast as the LaserWriter IINTX. The TurboPS/300 (\$5,495) and its 400-dpi cousin, the TurboPS/400 (\$6,495) feature RISC chips, PostScript-clone interpreters from RIPS, and Bitstream resident fonts. More significantly, the NewGen printers, although clones, *do* support the Adobe type library. Keep your eyes open for these printers!

Two more companies are marketing relabeled Qume printers. Abaton (Fremont, California) offers the Quickstep (\$4,495), and Dass Group Technologies (Canoga Park, California) is shipping the MegaWriter PS (\$4,295). Both are identical to Qume's PostScript clone in every way, so their performance should be identical. However, neither is as economical as the offerings from Jasmine and LaCie.

— Aileen Abernathy

Acknowledgments

MacUser Labs would like to thank the members of our advisory panel: Jim Gable and Steve Rea of Apple Computer; Ted White of Camintonn Corp.; Arnie Peters of Canon Corp.; Robert Ross, Jr., of QMS; Mike Harris of Qume; and Bill Woodruff of Dot Science.



It's true... We've expanded our popular Cirrus™ Drive family to include the security and convenience of removable drive technology. As an introduction to these exciting new drives, we're offering a FREE Mac Plus with the purchase of our new 600MB Optical Drive.* But act now, this offer is limited!

The Cirrus 600MO — The question is not whether you will buy an optical drive, it's when?

Experience the future in optical data storage technology today. The Cirrus 600MO Magneto-Optical Drive (shown above right) gives you 600 megabytes of erasable, removable and affordable data storage you can hold in your hand.

Simply write, erase and rewrite your data ... a million times over ... one file after another. Then remove and lock up the cartridge for complete security. This is the optimal drive for high capacity storage needs like large databases, CAD applications, desktop publishing, graphic images, file serving, backup and more.

The only limit is time. Purchase a Cirrus Magneto-Optical drive now and receive a FREE Mac Plus or \$1200 on any Apple product.*

The Cirrus 45R — When speed, portability, unlimited data storage and price are at the top of your priorities.

This just may be the only storage device you'll ever need. The Cirrus 45 MB Removable Cartridge Drive

FREE Mac Plus!

(shown above left) with its limitless storage capability is as convenient as a floppy and as fast as a hard disk. Which makes it ideal for organizing or backing up data quickly — or for transporting data between locations and accessing archived information instantly.

Cartridges are completely interchangeable with other Syquest-type cartridges and may be used on any Syquest cartridge drive.

There is no time like the present.

For a limited time we're offering a removable cartridge and a handsome Cordura™ carrying case absolutely FREE — a \$168.95 value.

FREE Software too!

Purchase either Cirrus Removable Drive now and you'll also receive Silverlining™ hard disk management software and Silverserver™ disk sharing software FREE — an additional \$169.90 value — *"an outstanding set of utilities."* MacWorld, May 1989.

Move up to removable drive technology today!

Compare Removable Drive Prices		
ERASABLE OPTICAL DRIVES	Drive	Cartridge
• La Cie Cirrus 600MO	\$4995	\$249
• Jasmine DirectOptical™	\$4995	\$298
• Pinnacle Micro REO-650™	\$5995	\$250
SYQUEST CARTRIDGE DRIVES	Drive	Cartridge
• La Cie Cirrus 45R	\$ 999	\$129
• Mass Microsystems DataPak™	\$1799	\$149
• Peripheral Land Infinity 40 Turbo™	\$1795	\$149
All Syquest Drives use the same drive mechanism.		

**Call us now.
1-800-999-0143**

LaCie™

16285 SW 85th • Bldg. 306
Tigard, OR 97224 • (503) 684-0143
FAX: (503) 624-0919

Please circle 75 on reader service card.

La Cie's prices shown are cash prices and do not include shipping. Add 3% for VISA, Mastercard, 5% for American Express. Add 10% for rush handling. La Cie, Cirrus, Silverlining and Silverserver are trademarks of La Cie, Ltd. Other product and company names shown are registered trademarks of their respective companies. Prices and specifications shown are subject to change without notice. Price comparison table taken from MacWorld, July 1989. *Call for complete details, some restrictions may apply.

The Bottom Line

In a rapidly changing market, "what's hip today just might become passé." So it is with PostScript printers. New products come out so rapidly that today's front-runner might fall back into the pack before you can reach the store to buy it. As with cars, you may find yourself relying on a company's reputation rather than going with the recommendation of a specific year's model.



Apple LaserWriter IINTX

Nevertheless, we do have some favorites. Topping the list is the **Apple LaserWriter IINTX**, a true high-performance machine. It has a 68020 processor and an optional SCSI hard disk for downloadable fonts, and it packs all that power into an easy-to-use, sleek desktop package. At \$6,999, however, it's not cheap.

The **Dataproducts LZR 1260** is also an excellent performer. It's the fastest printer we tested, and a hard disk is available. Although it costs \$1,000 more than the NTX, we rate it nearly as high. This is not one for the desktop, though. Its bulkiness and multibin options make it more of an industrial-strength machine.



GCC Business LaserPrinter

You may not need that much power or want to spend that much money. Among the standard 300-dpi models, the **GCC Business LaserPrinter** (\$4,199) is a solid performer, with excellent type quality and a hard-disk option. This is our favorite of the low-cost printers, although its toner-replacement technique is poorly designed, making it easy to spill toner inside the printer.

If you need a two-tray machine, check out the **QMS-PS 820**. Although priced too high (\$6,495), it has excellent performance

and an engine life rated at 600,000 pages, which is twice that of the NTX. QMS has an excellent reputation. The printers it will release later this year — 68020-based "Turbo" models of the current PS 810 and PS 820 — are the ones to watch, and maybe even wait, for. The PS 820 Turbo will certainly give the NTX a run for the money.

The **Camintonn TurboLaser**, also too expensive in our opinion (\$6,495), has one feature that none of the other printers offer. It can *simultaneously* support multiple connections — LocalTalk, serial, and parallel. The printer polls the various data ports to see which one wants to talk to it. It's worth considering if you have a mixed Mac/PC environment.



Varietyper VT600P

If you're looking for ultra-high resolution, and you can afford the \$17,000 price, check out the **Varietyper VT600P**. This 600-dpi printer has excellent

print quality and a fair amount of zip to boot. It could be an attractive alternative to Linotronic output for some types of work.

Finally, there are the clones: the **Qume CrystalPrint Publisher** and its identical triplets, the **Jasmine DirectPrint** and **LaCie Panther PDX**. These non-Adobe PostScript printers can perform 1.4 times as well as the NT but cost less. The Qume is \$4,499, and the Jasmine and LaCie are \$3,495, giving them the best price/performance ratio of all the printers.

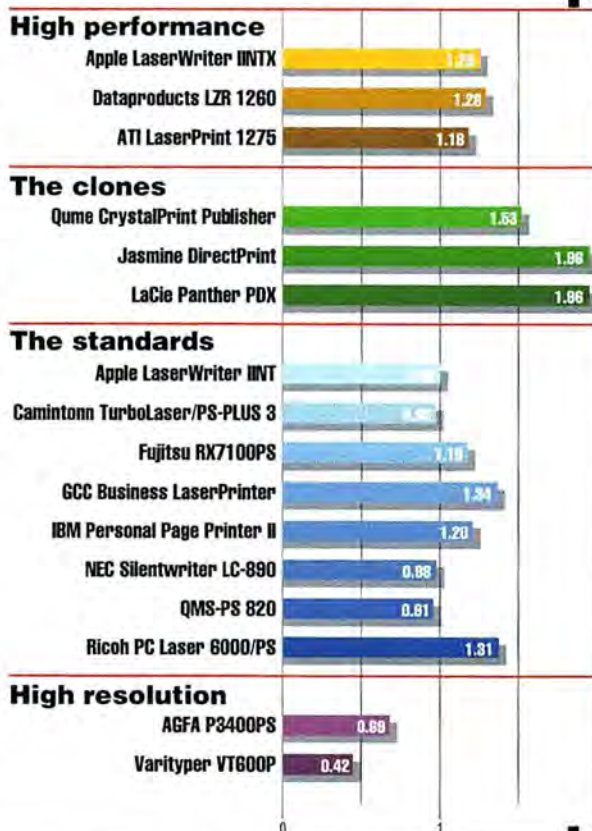


Qume CrystalPrint Publisher Jasmine DirectPrint LaCie Panther PDX

Except for the 600-dpi Varietyper, these printers had the best overall output quality as well. Compatibility with Adobe PostScript models is very high if you stick to the 35 fonts resident in the printer. But all bets are off — for both performance and compatibility — if you use downloadable fonts. And their failure to work with the new LaserWriter driver (version 6.0) raises questions about future compatibility.

A final note: Our price/performance data is based on manufacturers' list prices. For many of these printers, you can find significantly lower street prices. So you may want to recalculate the price/performance ratio of a particular printer, based on the best price you can find.

Figure 8: Price versus Performance



The clones are the clear winners in bang for the buck, as far as performance is concerned. The GCC and Ricoh printers, among the standards, and the Dataproducts LZR 1260 and Apple LaserWriter IINTX, among the high performers, have a slight edge over the competition in their respective categories. But before making a buying decision, consider factors such as output quality, paper handling, and compatibility. The Varietyper and AGFA printers, for example, are good performers but do poorly on the price/performance comparison because you pay the price for higher resolution. And the clones, despite their impressive standing, are probably a poor choice for use with a large type library.

We the People

insure domestic Tranquility, provide for the common
and our Posterity. We ordain and establish this

FOR DATA YOU'D PAY ANYTHING TO PROTECT.

*Section. 1. All legislative Powers herein granted
of Representatives.*

*Section. 2. The House of Representatives shall
in each State shall have ^{the} Qualifications requisite for*

*No Person shall be a Representative who shall
and who shall not, when elected, be an Inhabitant of*

*Representatives and direct Taxes shall be apportioned
Numbers, which shall be determined by adding to the whole
not taxed, three fifths of all other Persons.*

*and within every subsequent Term of ten years, on such
thirty Thousand, but each State shall have at Least
entitled to chuse three; Massachusetts eight; Rhode
eight; Delaware one; Maryland six; Virginia ten;*

*When vacancies happen in the Representation
The House of Representatives shall chuse*

For information that's invaluable, errors
are insufferable. And loss is unthinkable.

If the data you deal with is too
important to trust to ordinary diskettes,

insist on Mitsubishi. Manufactured to
the world's highest standards. To protect
the world's most important data.



**MITSUBISHI
DISKETTES**

Kasei Memory Products Inc. (A Subsidiary of Mitsubishi Kasei America Inc.)

535 Independence Parkway, Chesapeake, Virginia 23320. Telephone (804) 547-5477 1-800-274-1704.

Please circle 164 on reader service card.



POWER TOOLS

EDITED BY
JAMES FINN AND
KRISTI COALE

Want to get the most out of your Mac? Welcome to our new Power Tools section, devoted entirely to productivity. We'll help you get more from your software and hardware with practical how-to articles, and we'll demystify technology and its jargon with informative reports. Help Folder and Tip Sheet will now be found here, and there's a lot more. This month we'll tell you about utilities that work better than the Mac's Finder, show you how to diagnose keyboard problems, and introduce a new department called Beating the System, by Michael Swaine.

Is the Finder keeping you in chains? Here's how to break free and increase your productivity.

Losing Your Finder

Break free of the Finder? But the Finder is the Mac, or so it seems. The electronic desktop, with its familiar world of icons, folders, and windows, is to most users the heart of the Macintosh interface.

Maybe so, but this is one heart that could use a good aerobic workout. The Finder inaugurated a clever desktop metaphor that was ideally suited to the world of Macs equipped with only 400K floppy drives. But in the modern age of hard-disk drives with thousands of files, the Finder's way of doing things often slows you down.

The Finder is essentially just another application, a utility program with two purposes. First, it gives you the means to run (or launch) other applications. Second, it provides a set of file-management functions for such common operations as copying, moving, renaming, deleting, and listing files. A program that provides such services is often referred to as a

shell; the Finder is a shell program for the Mac, one that's cracking with age.

The main problem is that the Finder is tied to the hierarchical structure of the Mac's file system. Want to launch MacWrite? You first have to open folders until you reach the one containing it. Ditto for launching a document. Besides being time-consuming, this process leaves your desktop cluttered with open folders, which is doubly annoying when you use MultiFinder.

The Finder's file management also suffers from this approach. Want to move some files from one folder to another? Double the clutter: You have to open the source folder, expose the destination folder, and make sure that one doesn't cover the other.

You learn to work around it. You start organizing your hard disk to serve the Finder, keeping frequently used documents and applications on or close to the desktop so you won't have to open so many folders. This compromise defeats the purpose of the Mac's Hierarchical File System (HFS). You should be able to create a folder structure to organize files the way you want, not the way the Finder wants. Working within a hierarchical structure is a great way to organize your disk, but it's a slow way to perform most of the functions you associate with a shell.



Write To
Power Tools
c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

MacUser welcomes your input. Please specify on the envelope and in your letter whether you're writing to Chris Espinosa (Help Folder), Michael Swaine (Beating the System), Greg Wasson (Tip Sheet), or James Finn and Kristi Coale (for all other ideas for the section). We pay \$25 for every idea or tip we use, and the Tip of the Month gets \$100.

By James Finn



Figure 1: PowerStation is the ultimate launching pad. Applications and DAs are installed in buttons and can be opened with a mouse click or from the keyboard. The Expense Report Form button appears in a different font because it has been dedicated to a single document.

There is a better way. Inexpensive commercial programs offer power lacking in the Finder. By using several of them, you can bypass the Finder altogether. I'll look at my two favorite application launchers, Software Supply's PowerStation and ICOM Simulations' On Cue, and at my preferred file-management utility, CE Software's DiskTop.

Let's Do Launch

PowerStation is a program that you place in the System Folder. Set it to be your startup application (using either the Finder's or Power-



Figure 2: Clicking on the document icon to the right of the WriteNow 2.0 button yields this PowerStation dialog box. You can install, open, or print multiple documents, which need not be in the same folder. Documents with check marks are automatically preselected when the dialog box appears.

Station's Set Startup command) and you can say goodbye to the Finder.

PowerStation is the ultimate launching pad (see Figure 1). It gives you a screenful (actually up to 16 screenfuls, or "pages") of buttons, into which you can install all of your favorite applications and even DAs. Click on a button, and the application launches. Click on the little menu icon to the button's left, and — surprise! — a pop-up menu lets you rename, cut, or paste buttons (entire pages of buttons can also be cut and pasted).

Click on the little document icon at the right of the button, and you enter power-user's heaven, a dialog box for attaching documents to the application (see Figure 2). You can select multiple documents at once, even if they're not in the same folder, and open them all by clicking on the Open button. Put a check mark by any documents you use frequently,

and they'll be preselected automatically whenever the dialog box appears. As the figure shows, the program has many more options for customizing button behavior.

Even with all its features, PowerStation is simple to use. A command quickly sorts the buttons on screen, and you can anchor buttons that you don't want moved during sorts. If you reorganize your hard disk, PowerStation can relocate all installed applications and documents with a single command. You can even designate a page of buttons as the "startup page," and all the programs on it will launch each time you boot your Mac.

On Cue, another commercial launching pad (see Figure 3), is an INIT (startup document) that creates a menu in the upper right corner of your screen (you can also assign a key combination that causes the menu to pop up under the cursor wherever you click — great for large screens). Install your favorite applications and documents into the menu and launch them thereafter by selecting them.

Since On Cue isn't an application, it can't replace the Finder, but it makes a good supplement. On Cue isn't as powerful as PowerStation; there's no way, for example, to open more than one document at a time. But, unlike PowerStation, On Cue lets you launch a new application without first quitting the current one.

Access to Files

So much for program launchers. Moving on to file managers, my favorite is DiskTop, a DA that I use constantly. DiskTop can copy, move, delete, and rename files and folders, all from within any application — and that's only the beginning.

A flexible Find command quickly searches for files on your disks by name, type, creator, size, or date created or modified. Power users



Figure 3: On Cue, another commercial launching pad, creates a permanent menu to which you add your favorite applications and documents (which appear in submenus). You can jump to a new application without first quitting the current one.

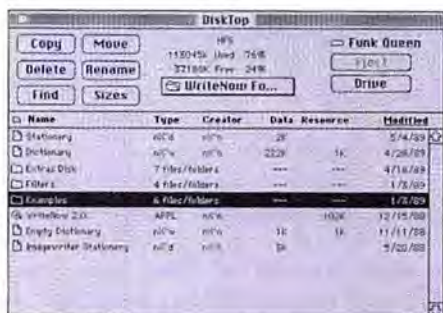


Figure 4: DiskTop provides most of the power of the Finder in a DA with a convenient interface. This is the Files window, with the display sorted by date modified. You can change the order of the sort by clicking on any column heading.



can switch the Files display from "Normal" to "Technical"; listings then show the type and creator of each file (see Figure 4), and you can access the file's Finder bits (such as Locked and Invisible).

DiskTop lets you launch an application or document by locating it and double-clicking on it in the Files window. In addition, you can install up to 20 files onto DiskTop's menu for faster access to launching. Somehow, though, I find that using DiskTop for launching is less convenient than using either PowerStation or On Cue.

An alternative to DiskTop is DiskTools II, a DA that ships with Electronic Arts' DiskTools Plus package. Similar in function to DiskTop, it uses a different interface. You might try both to see which you prefer.

MultiFinder Mania

Life becomes even more fun when you're using MultiFinder. PowerStation lets you run MultiFinder without (or, if you must, with) the Finder. I love this feature. Without the Finder, you see only the windows for your open applications — no icons for mounted disks, trash, and files on the desktop; no windows for open folders; in short, no clutter. Inserting a floppy disk is faster, since the Finder isn't scanning the Desktop file to draw a disk icon or open windows. And with MultiFinder, PowerStation is always there, so, memory permitting, you no longer have to quit one application before launching another.

On Cue can place a list of open applications at the top of its menu, making it easy to switch among them. Using such a list is more convenient than using the Apple menu, which places the application list below all the DAs. On Cue's list includes an entry for the DA layer, something that Apple omitted.

Future Perfect?

SADE, Apple's new debugging environment, currently ships with a beta version of a new MultiFinder. Among other new features, the list of open applications now appears at the top of the Apple menu instead of at the bottom.

Apple also recently announced many features of System 7.0, to be released sometime before the world ends (see News Line, August '89). Finder 7.0 is a much improved shell. I don't have the space to discuss all its features, but you will be able to install applications and documents directly into the Apple menu, and an integrated Find command can locate a file and then immediately open its folder on the desktop. System 7.0 will, however, require at least 2 megabytes of RAM.

So it looks as though most of On Cue's functionality is being incorporated into the Finder, although probably not as elegantly. I expect that PowerStation and DiskTop will remain as indispensable with the new System as they are today.

The Finder is cute, but when you're ready to move on from cute to productive, take a look at what these tools can do for you.

Product Directory

PowerStation

Version 2.5
Fifth Generation Systems
11200 Industriplex Blvd.
Baton Rouge, LA
70809-4112
(504) 291-7221
\$59.95

On Cue

Version 1.3
ICOM Simulations
648 S. Wheeling Road
Wheeling, IL 60090
(312) 520-4440
\$59.95

DiskTop

Version 3.0.4
CE Software
1854 Fuller Road
P.O. Box 65580
West Des Moines, IA
50265
(515) 224-1995
\$49.95

DiskTools Plus

Version 1.01
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
\$49.95



Live with the Finder

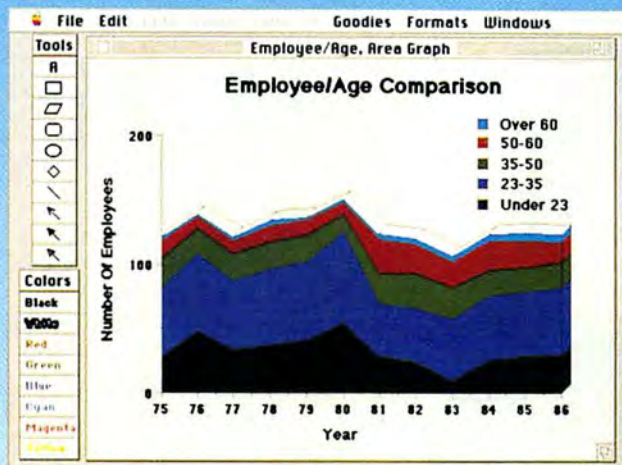
If you use the Finder, here are some reminders and advanced tips to make it a more-effective shell.

1. If you hold down the Option key while opening a folder or disk, the window opens only temporarily. When you launch an application and then return to the Finder, the window will be closed.
2. By holding down the Option key while closing a window, you can make all the windows on the desktop close.
3. When you hold down the Command key and click in the title bar of an inactive window, you can move that window on the desktop without activating it and bringing it to the front.
4. The new MultiFinder (currently distributed with the Standard Apple Debug-
- ging Environment, or SADE) adds a Set Aside [*application name*] item to the Apple menu. Selecting this removes all the windows of the current application. If you hold down the Option key, Set Aside [*application name*] changes to Set Aside Others, removing all windows except for those of the current application.
5. In this new MultiFinder, hold down the Option key when clicking on an application's window or on the small icon at the right edge of the menu bar and the current application will be set aside as you switch to the next.

— James Finn

Cricket Means Business.

for all your presentation and graphing needs



cricket GRAPH

1986 *MacUser Magazine* "Best New Graphics Program."

1987 *MacWorld Magazine* "World Class Award."

1988 *MacUser Magazine* "Reader's Choice Award."

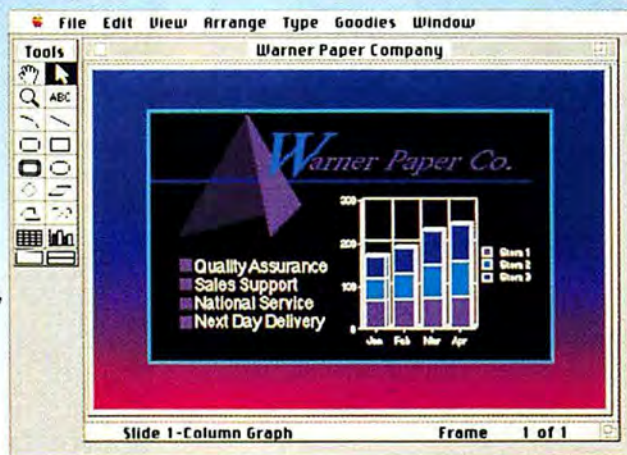
Cricket Graph™ is the recognized standard for Macintosh graphing. Its graphing flexibility, combined with an intuitive user interface, make it easy for anyone to create a wide variety of business and scientific graphs including Column, Bar, Stacked Column, Stacked Bar, Pie, Area, Line, Scatter, Double Y, Polar, Text and Quality Control graphs.

cricket Presents...

"For creation of 35-mm. slides, overheads, and other visuals, Cricket Presents 2.0 is the top choice in the Macintosh desktop presentation market."

—Datapro Research, February 1989

Cricket Presents™ has everything you need to organize information, create complete presentations including tables, graphs, and supporting materials, and produce beautiful color and black-and-white overheads and 35mm slides. Its powerful capabilities include a professionally-designed template library, a spelling checker and thesaurus, coordinated color schemes, and automatic presentation generation with the Acta™ outliner and Auto Presents.



Cricket Software. The only name you need to know for advanced drawing, painting, graphing, or presentation applications for the Macintosh®.

Call (215) 889-1950 for the Cricket Software dealer nearest you.

cricket
software

The Leader in Graphics Productivity

© Copyright 1989 Cricket Software, Inc.
Cricket Graph and Cricket Presents are trademarks of Cricket Software, Inc.
Acta is a trademark of Symmetry Corporation. Macintosh is a registered trademark of Apple Computer, Inc.

**Get \$25 Back when you buy
Cricket Graph or Cricket Presents!**

Just send proof of purchase (a photocopy of your receipt will do) along with your completed registration card to:

Cricket Rebate Offer
Cricket Software
40 Valley Stream Parkway
Malvern, PA 19355

Please allow 4 to 6 weeks for your rebate. Offer expires September 30, 1989.

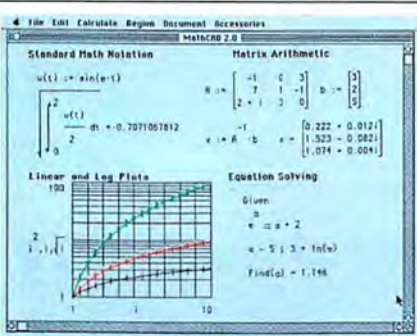
Please circle 147 on reader service card.

After centuries of practice, mankind perfects engineering calculations: MathCAD.

Announcing MathCAD: A Calculating Renaissance For Your Mac.

What the historians will call it, only time will tell.

Perhaps the Century of Speed, or the Era of Ease. But whatever the name, this is the age of MathCAD, the only math package that looks and works the way you think.

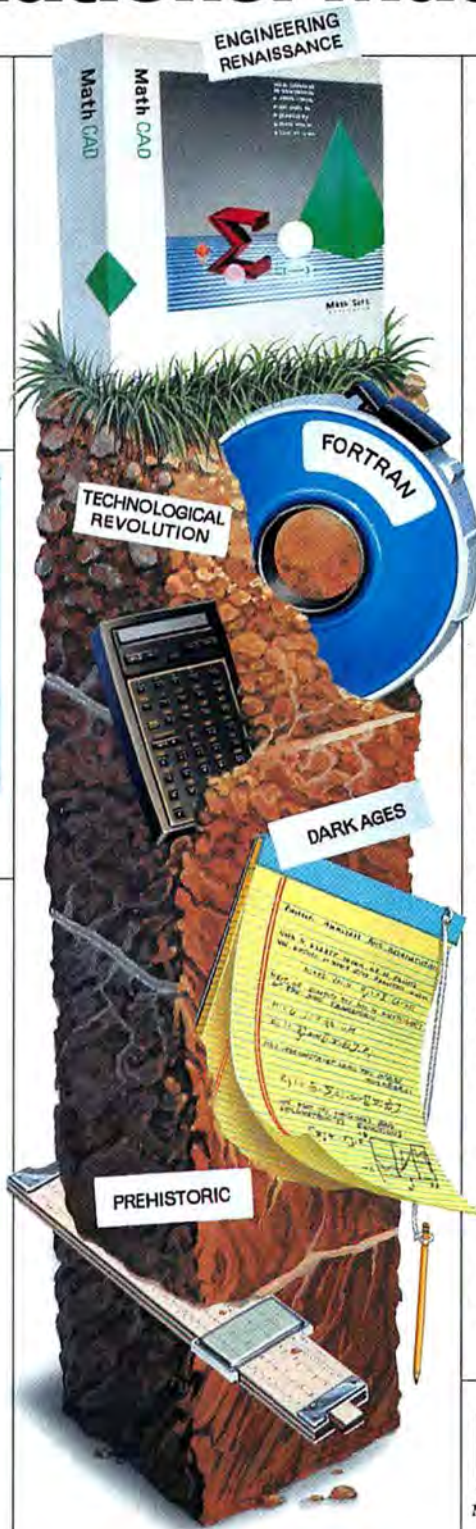


MathCAD takes full advantage of the Macintosh® interface, with features that make it simple to enter operators and Greek letters into equations.

MathCAD is the best selling math software in the world because it lets you perform engineering and scientific calculations in a way that's faster, more natural and less error-prone than the way you're doing them now—whether you're using a scratchpad, calculator, spreadsheet, or program that you wrote yourself. It gives you more control and more flexibility than ever before.

MathCAD's live document interface™ lets you enter equations anywhere on the screen, add text, and graph the results. Then print your analysis as a presentation quality document.

And it has over 120 commonly



used functions built right in, for handling all kinds of equations and formulas, as well as exponentials, differentials, cubic splines, FFTs and matrices.

No matter what kind of work you do, MathCAD has a solution for you. In fact, it's used by over 50,000 engineers and scientists, including electrical, industrial, and mechanical engineers, physicists, biologists, and economists.

But don't take our word for it. Just recently MathCAD was reviewed as being "everything you have ever dreamed about in a mathematical toolbox." And when it was compared to the competition, it was "MathCAD by a mile."

And if you work with an IBM® PC or compatible, there's a MathCAD version designed exclusively for you. Or if you use both Macs and PCs, don't worry: MathCAD files are completely compatible between the two.

Look for MathCAD at your local software dealer. Or call MathSoft at 1-800-MATHCAD (in MA, 617-577-1017) for more information or for a free demo disk.

Speed, power and flexibility. Enter the new era of engineering and scientific calculations, with MathCAD.

System Requirements: Apple Macintosh Plus, SE or II, with a minimum of 1MB RAM. Supports all ImageWriters® and LaserWriters®.

MathCAD®

MathSoft, Inc. One Kendall Square, Cambridge, MA 02139

Getting Involved with Your System

You can't fight City Hall, but you *can* beat the system — that's System as in file or folder. We'll even help you in Beating the System.

Each month we'll take a user's-eye view of the Finder, the System file, cdevs, INITs, and the other pieces that make up the operating system of the Macintosh. The Macintosh System has a lot of power and flexibility, but trying to find that power and flexibility can be like straying from the tour in a country where you don't speak the language. Our purpose here is to equip you to get along on your own in System territory. We will leave the guided tours and tourist traps to others because ours will be a business trip: We are here to get something done.

The "we" is not an editorial affectation. I hope you will be inspired to share your own insights and discoveries with other Mac users through Beating the System. In "Beating the Puzzle" (see sidebar), you will find several addresses at which I can be reached. I can't promise a personal response, but I do promise to publish useful tips on using, extending, and customizing the System and to investigate any broadly interesting problems in the way the System operates.

In the middle of this article is a little puzzle

By Michael Swaine

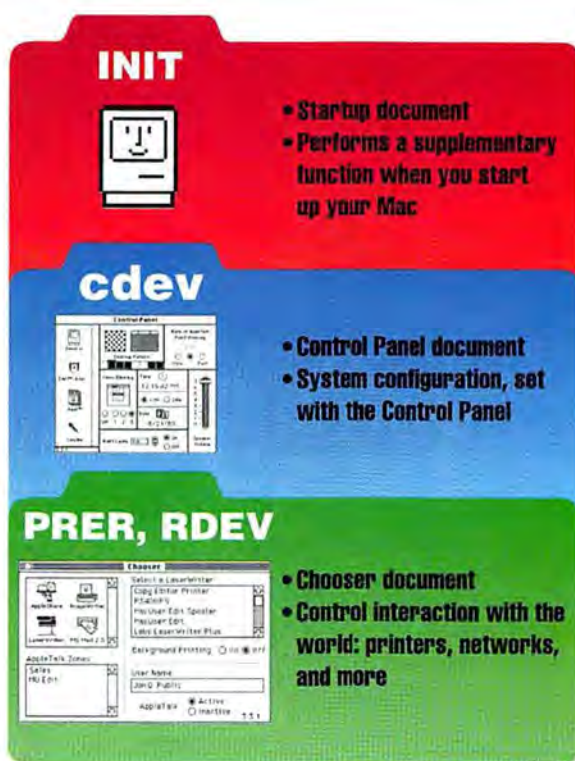


ILLUSTRATION MARK W. SWEENEY

Most extensions to the Macintosh operating system involve adding documents to the System folder. The most common types of extensions are INITs (Startup documents), cdevs (controlled through the Control Panel), and PRERs and RDEVs (accessed through the Chooser).

dealing with the way the System operates. If you solve it, you'll beat the System and discover another way to make your Macintosh just a bit more *your* Macintosh. And if yours is the first correct solution I receive, you'll win a T-shirt. Beating the System pays off in increased productivity and profits, and beating the other System beaters can increase your wardrobe.

This month, we'll go through all the preparations for the journey and look at the territory we will be exploring in the coming months.

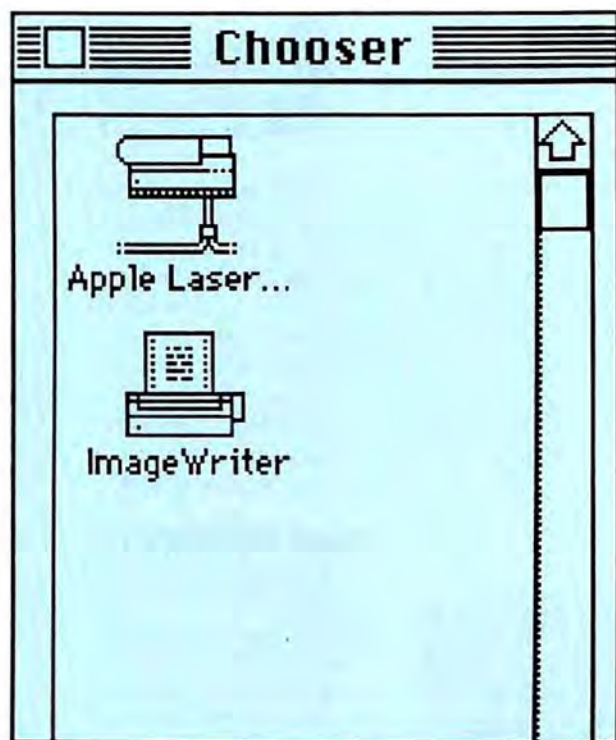
Beyond the Guidebooks

The first prerequisite to making the System do your bidding is knowing its capabilities, what it can and cannot do. The fluid ease of use of the Macintosh System discourages looking beyond its most obvious features; therefore, many Mac users rely on the most obvious methods, missing a lot of "power techniques." If you know that holding down the Option key as you quit from an application program also closes all open windows on the desktop, you probably learned it from *MacUser's* Tip Sheet or *The Macintosh Bible* and not from Apple's documentation. System features that have been around for several releases are sometimes little known and less understood. We will look at some of the most interesting of the least known, concentrating on solving practical problems.

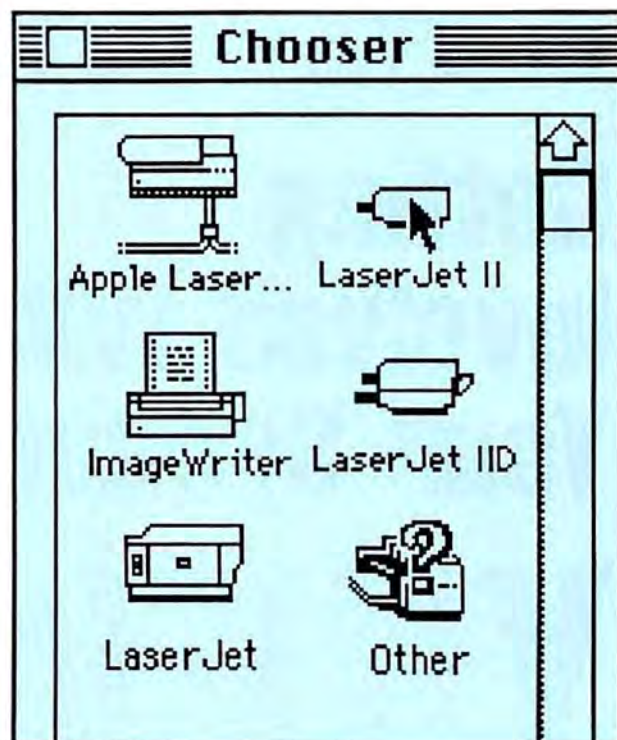
The System is a moving target, and we will study its maneuvers carefully. New System releases from Apple often contain surprising features, some documented, some not. Sometimes they are pleasant, sometimes not. We'll look at the additional features of new releases and also examine some practical implications of the general direction of Apple's future System releases.

Getting Your Documents Together

In addition to scrutinizing the System itself, we'll examine some extensions, mostly from third-party vendors. These extensions effectively become part of the System when placed in the System folder. You're probably familiar



Before MacPrint.



After MacPrint.

MacPrint has several advantages you can easily point to.

In the dark days before MacPrint,[™] Mac users had only a few output options. Now your options are open. You can print virtually any Mac application on a whole range of high quality, lower-priced printers. Including HP LaserJet IID, LaserJet Series II and compatibles. MacPrint supports all HP internal and cartridge fonts. You can print two sides of a page and from dual bins in legal and standard sizes.

MacPrint is a chooser-level utility. It's exceptionally easy to use. In fact, once you choose the printer

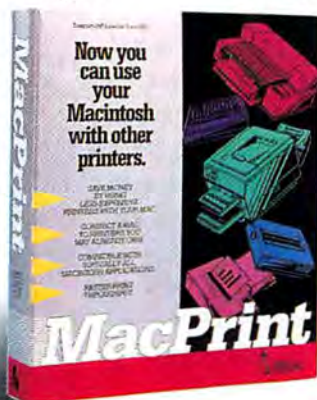
on a simple set-up screen, MacPrint is completely transparent in action.

MacPrint displays all your printer's resident fonts for true WYSIWYG performance. If it can't find a resident font, it will create one based on the QuickDraw screen font. And MacPrint lets you print at your printer's maximum resolution: 75, 150, or 300dpi.

Here's one more advantage you can point to: MacPrint costs just \$149.

Call your local dealer or order direct from Insight.
(415) 376-9500.

See us at
MacWorld Expo, Booth #5662
World Trade Center



**INSIGHT
DEVELOPMENT
CORPORATION**
Helping you get more from your printer.

with some of these already: Mouse, Keyboard, Easy Access, CloseView, LaserWriter, and AppleShare.

Most System extensions are Startup documents, Control Panel documents, or Chooser documents. Startup documents, commonly referred to as INITs, are files that perform a one-time function when you start the machine. Control Panel devices (cdevs) are documents that configure the System or perform a startup function; they are controlled through the Control Panel desk accessory (DA). Chooser documents (PRERs and RDEVs) manage the Macintosh's interaction with the outside world of printers, networks, and the like.

The aforementioned extensions are all Apple's: Mouse and Keyboard are Control Panel documents, Easy Access and CloseView are Startup documents, and LaserWriter and AppleShare are Chooser documents. Third-party vendors have added tools that extend the System in various ways. For example, Nine to Five's Preview is a Chooser document that "prints" to the screen, allowing you to preview printed documents even from applications that lack a built-in Preview option. Other third-

party extensions remap keystrokes to enable you to create keyboard macros or to automatically substitute "smart" quotes (true left and right quotes) for the ambidextrous computer-keyboard ones. They can alter the way generic dialogs work — adding a New Folder option to the standard file dialog, for example, so that when you create a new file within any application, you can simultaneously create a folder to hold it. One Control Panel document lets Macintosh II users toggle to a Plus/SE display, useful if you are designing forms on one machine for use on another.

Some extensions work invisibly, such as those that turn the memory cache on or off, or check the System for viruses. Another example is the Radius SANE Startup document, which does nothing but speed up your operations a bit by providing a different path for math operations.

Because Apple allowed for such extensions, making the System work more like you do can be as simple as putting the right documents into your System folder. We'll look at what should be in the System folder for handling a variety of situations.

Customizing the System by actually modifying System files seems difficult and dangerous. It turns out to be neither, once you know what you're doing.

Beating the Puzzle

Here's a puzzle whose solution involves a little-known feature of the Macintosh System.

Here's a screen shot from a Macintosh SE. This is the entire screen. MultiFinder is not active, as can be seen by the lack of any icon at the right end of the menu bar. Two windows are visible: the System-folder window and the hard disk window named Studio. Note that the System-folder window fills the screen entirely and that the Studio window is in front of it, with the icon for the System-folder window highlighted. We can account for all 23 of the System-folder window's files and folders, and we can see that the System folder resides in the Studio folder.

What is the System-folder window doing behind the Studio window? Opening or selecting the System-folder window should have brought it to the front. The Studio window could then have been dragged to its present position, but if so, where was it dragged from? If bringing it forward involved clicking on the icon for the Studio folder, where is that icon? Nowhere within



What's going on here? How did the Studio window get in front of the System-folder window? Was it dragged to its present position? If so, where was it dragged from? How did these windows get stacked this way?

may be other solutions, but I've tried to eliminate the more obvious ones.

If you solve the puzzle, send your solution to Michael Swaine, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. The first correct solver will receive an "I beat the System and all I got was this lousy T-shirt" T-shirt.

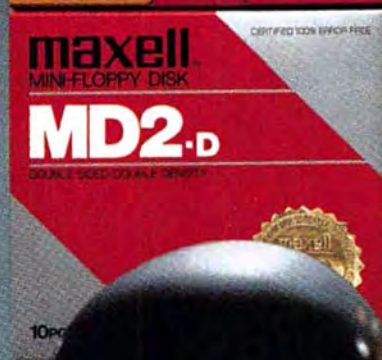
But don't wait until you have solved the puzzle to write. Send me your System insights, discoveries, and problems at the above address or at any of these: MCI Mail: MSWAINE; CompuServe: 72617,1256; MacNET: MSWAINE.

Send your solution to

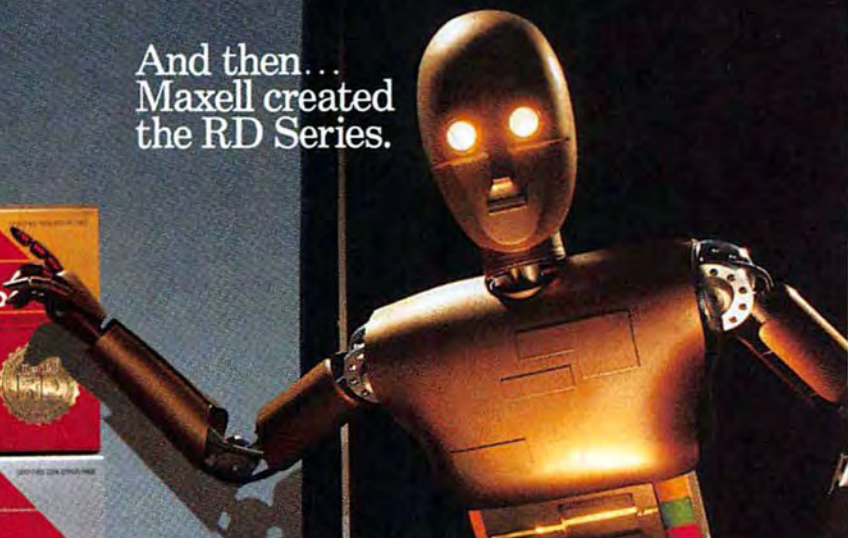
Michael Swaine
c/o *MacUser*
950 Tower Lane
18th Floor
Foster City, CA 94404

clicking range, since icons never appear in front of windows on the desktop and the System-folder window fills the desktop.

There is a solution, and it requires beating the System in one of the ways discussed here — there



And then...
Maxell created
the RD Series.



The
Evolution
of the
Floppy Disk

Maxell Corporation of America, 22-08 Route 208, Fair Lawn, NJ 07410

Never before has this level of Reliability
and Durability been available in floppy disks.
Introducing the new RD Series from Maxell.
Twice the durability of the disks you're now using.
Twice the resistance to dust and dirt.
And the RD Series is ten times more reliable
than conventional floppy disks.
The Gold Standard has always meant maximum
safety for your data. Now it means even more.



maxell[®]
THE GOLD STANDARD

Please circle 114 on reader service card.

One of the best introductions to System extension is Ted Landau's "What's INIT for You" (August '89). Landau's article also discusses some tools for managing Startup documents and creating "startup sets," logical groupings of Startup documents that effectively customize your machine for different uses. The focus here will be on using such tools to make your System better serve your purposes.

Getting through Customs

The third broad topic we will cover is the most ambitious — System customization.

Any of the extensions just discussed can be modified by use of a resource utility such as ResEdit to get inside the tool and alter its behavior. For example, by altering their resources, you can prevent Startup documents from splattering their icons all over your opening screen.

More importantly, you can modify the System itself. Customizing the operation of the System by modifying System files seems difficult and dangerous, but it turns out to be neither, once you know what you're doing. Resources are the key.

Resources are the foundation of every Macintosh program. Items such as icons, fonts, menus, dialog boxes, and alert boxes — all of which would otherwise be at least partially hidden in the code and data structures of programs — are stored as separate objects that can be manipulated and edited without any programming knowledge. A four-character designation identifies each type of resource; for instance, cdev and INIT are the resource types for the operational parts of Control Panel and Startup documents, respectively. Because Macintosh programs are constructed out of resources, users can modify compiled programs, including those that make up the System, without destroying the System in the process.


Getting It Out of Your System

Assuming that you have some reason to fiddle with the System, how do you go about it? One resource is the special edition of Tip Sheet by Darryl Lewis on customizing the Finder with ResEdit (June '89), which provides a good how-to on twiddling the bits in the Macintosh operating system. ResEdit is the most powerful general-user tool for manipulating System resources, but there are other such tools. REdit, Layout, Installer, and the familiar Font/DA Mover are all resource utilities.

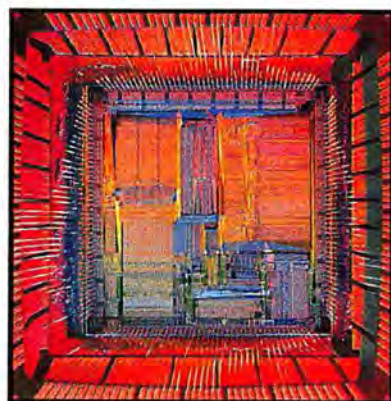
So much for the how-to. What about the why-to? Are there practical reasons for modifying the System's resources? There are — I count three.

First, you can add capabilities to the System by adding instances of an existing resource type. Fonts are the most obvious example. Adding fonts to your System file makes them available to all your applications; removing them reduces the memory demands of the System. For fonts, you don't need ResEdit; Font/DA Mover works fine.

Second, you can edit System resources to make your System work the way you need it to. As shipped, the Finder lets you open only 13 windows at a time. If that's not enough, you can change this limit, which is an attribute of the layout resource (called LAYO in ResEdit) of the Finder, which also defines the layout of the desktop. By setting an attribute of the LAYO resource, you can raise or lower the limit. (If you know you'll never want 13 windows open simultaneously, you'll gain some extra memory by lowering it.)

Third, you can edit System resources to enable "hidden" features of the System. One such feature is New Folder Inherit, another feature of the Finder's LAYO resource, one that is disabled in the Finder as Apple ships it. Turning on New Folder Inherit causes a new folder to "inherit" properties of the folder it came from. For example, with New Folder Inherit turned on, if you set a folder to View by Name, all folders created within it will also be View by Name folders. Similarly, future installments of this department will inherit the qualities of this one: They will cover Apple's System software and how you can extend or customize it to your needs. 

The Looking Glass



Motorola's MC88100 RISC Microprocessor

A spaced odyssey? No, this is really a photo of Motorola's MC88100 RISC microprocessor. RISC (reduced instruction set computer) chips are fast (see "Worth the RISC" sidebar in "Fit to Print" in this issue): Motorola claims this chip runs at 14 to 17 VAX MIPS, or 14 to 17 times faster than Digital's VAX 11/780 minicomputer. OK, you want a measure in Mac MIPS, right? A Mac II is a 1-to-2-VAX-MIPS machine, so this chip should run about ten times faster than a Mac II. The 32-register 88100 includes integer and bit-field units, floating-point add and multiply units, and data and instruction units. Will this chip be used to power the rumored RISC Mac? Only the Apple knows.

Keyboard Diagnostics

The problem:

You're typing along contentedly, when the cursor suddenly stops reacting to your keystrokes. You jiggle the connections, which lets you get back to work, but only temporarily — your keyboard eventually quits again.

The solution:

Run a battery of diagnostic tests. Is the problem something as simple as dirty outlets, a bad cable, or a bad keyboard, or is the problem inside the Mac? In some cases, you can take care of it yourself.

The tools:

You may need small needle-nose pliers, a telephone crimper, scissors, a razor blade, a sharp knife, telephone-handset connectors, a spare keyboard cable, a spare keyboard, and a spare Mac.



Warning

The hazards: Make sure the Mac is turned off while you're working on any internal parts. You'll also want it turned off if your keyboard is ADB (Apple Desktop Bus, common to all Macs in the SE and II families). Unplugging and then reconnecting an ADB device while the Mac is on can destroy the ADB chip in the Mac.

Try fixing the cable



Check connectors



YES

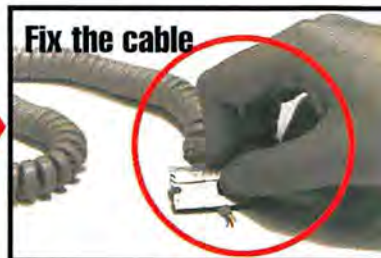
Is your keyboard ADB?

NO

Clean the outlets



Fix the cable



Try another port



Hypochondriacs tend to run to the doctor at the smallest sign of illness — a mighty expensive practice these days. HypochondriMacs face similar financial woes when dealing with the slightest malfunction of their computers. In both cases, self-diagnosis is a key not only to saving money but also to learning more about the mechanisms involved.

Take your Mac's keyboard, for instance. If your keyboard isn't working, it might be because of something that's easy to fix, such as dirty connection points. You can pinpoint the problem (and, hopefully, remedy it), using this diagnosis map.

By Kristi Coale

● **Check connectors.** If you can get the keyboard to work by playing with the ends in the sockets, you might have a connector that's not completely inserted, even though it seems snug.

● **Is your keyboard ADB** (Apple Desktop Bus)? Yes: Follow green path. No: Follow red path.

● **Clean the outlets** on the Mac and the keyboard with the power turned off. Run a very sharp knife between the wires in the outlets, being careful to move the knife parallel to the wires — moving the knife across can bend them. A spray contact cleaner may also work.

● **Fix the cable.** Sometimes the thin wires where the cable meets the connector fray because of bending, twisting, and pulling at these points. A silver lining of not having an ADB keyboard is that the cable is easier to fix than an ADB cable — it's similar in structure to a telephone-handset cable. Electronics and hardware stores carry telephone-handset connectors



Replace the cable



Cut the wire




Swap parts



If all else fails:

Maybe your Mac is sick. To find out if this is the case, plug your keyboard and cable into a spare Mac. (You might be able to play with one at your local service bureau, or you might want to arrange a short-term Mac rental; you may need a spare Mac in this phase anyway.) If your keyboard still doesn't respond correctly, try it with the spare cable or try your cable with the spare keyboard. There may be some problem with the connections or, in the case of ADB equipment, in the daisy-chaining of the components.

If your keyboard works with the spare Mac, then the problem is inside your Mac. The complication may stem from a bad ADB chip or, in the case of the Plus or earlier model, a bad VIA (Versatile Interface Adapter) chip. Once you've confirmed this conclusion, you'll have to take your Mac to an authorized Apple dealer.

Although self-diagnosis may eventually send you to the dealer, at least you'll have a better idea of what can go wrong with your Mac. In the best case, you'll gain more confidence in your ability to find and fix the complication, and you'll save some money along the way. 

Use telephone cable



PHOTOGRAPH BY PETER ALAN GOULD

and crimping tools to attach these connectors to a cable. The connectors, which are the same size as the ones on the cable, cost only a few cents each, and the crimpers cost about \$7.

Use scissors to clip off the old ends and a razor blade to shave off the plastic coating around the wires (half a centimeter from each end), exposing them. Slide the exposed wires into the connector and crimp it to the cable. The most common kind of crimper is made for larger wall-socket connectors. Using handset connectors involves some trial and error, since the crimper's socket is slightly larger than a connector. You may need to push the gold contacts down further with a thin-blade screwdriver or knife. (This can damage the plastic separators, so have a few extra connectors on hand, just in case.)

● **Use telephone cable** as a replacement for a Plus cable. Its wiring is the opposite of the Plus cable's, so you'll need to clip off the connectors and turn the cable over to have the wires in the same position as in the Apple cable. Just crimp

on some new connectors, and you're ready to go to work.

● **Cut the wire.** A simpler solution is to cut a handset cable and expose half an inch of the inner wires. Then reverse the connections and tape each splice. Tape the entire connection, overlapping half an inch or more of the sheath.

● **Try fixing the cable.** A bad ADB connection can be the result of a bent or pushed-in pin (if you've pushed the end into the wrong port or into the correct port the wrong way). Use a small pair of needle-nose pliers to straighten a bent pin or grab on to the tip of a pushed-in pin and pull it back into position.

● **Try another port.** Bad connections can result from a bad cable port on your Mac or keyboard — try plugging the cable into the other ports.

● **Replace the cable.** Replacing the connectors on an ADB cable is difficult. You'll have a hard time tracking

down a supplier of ADB connectors, and then you're stuck having to attach them to the cable. You'll probably prefer just to buy another cable. Apple dealers sell them for \$18 (Plus cables are \$13); user groups often sell them for less.

● **Swap parts.** If these procedures fail to revive the patient, then you're ready to swap some parts. You'll need an extra cable and keyboard. You may be able to borrow these from a friend or coworker.

In each of these tests, you should do a fair amount of typing; you'll want to test fast and slow keyboarding, and be sure to try holding down one key for a while.

If a spare cable works with your keyboard and Mac, you need a new cable.

If a spare keyboard works with your cable and Mac, send your keyboard out for repair (or look up "Chairman of the Keyboard," June '88, if you want to tackle it yourself).

If you can solve the problem by using a spare keyboard and a spare cable with your Mac, you need to fix or replace both the cable and the keyboard.



NOW FEED YOUR COMPUTER DELICIOUS COLORS, AT A PRICE THAT'S EASY TO SWALLOW.

Introducing the Sharp JX-300 letter size color scanner.

Our affordable, new JX-300 can scan the most appetizing color originals up to 8½" x 11". It also has a small footprint and fixed scanning bed to give you more usable desk space.

This new color scanner joins our larger, widely acclaimed JX-450, which handles originals up to 11" x 17". The JX-450 also scans 35mm slides and overhead transparencies with an optional mirror unit.

Both units scan at 300 d.p.i. resolution and 256 shades for

each element to give a range of 16.7 million colors. Not to mention 256 gray scales for monochrome systems. Both are compatible with the leading PC systems.

Sharp also offers the JX-730 color inkjet printer to give you plain paper color printouts that are faithful to your originals.

If you're looking into scanners—even black and white scanners—don't overlook the future. The future is mouth watering color. For information, call 1-800-BE-SHARP.



SHARP
FROM SHARP MINDS
COME SHARP PRODUCTS™

© 1988 Sharp Electronics
Simulated Picture on Monitors

Please circle 158 on reader service card.

Tip Sheet

FullWrite Professional

With its Print Background Picture function, FullWrite Professional lets you print a graphic in Paint, PICT, or (on a PostScript printer) EPSF format on the same page as a FullWrite document. This means that you can create a fancy border in a graphics program and print a FullWrite document with the border surrounding it. Users who try this with EPSF files created in Illustrator 88 find, frustratingly enough, that it doesn't work. Apparently the problem is that Illustrator 88 includes color-PostScript information in its EPSF files that FullWrite doesn't understand.

Here's a workaround: In Illustrator's Save As dialog box, check the "Save Adobe Illustrator 1.1 compatible file" and "Include copies of placed Encapsulated PostScript files" boxes. Now the background picture will be fine (but it will be in black and white), although you may have to adjust the placement of the Illustrator graphics.

Glenn Davis
Santa Cruz, CA

Smart Art 1.0.1

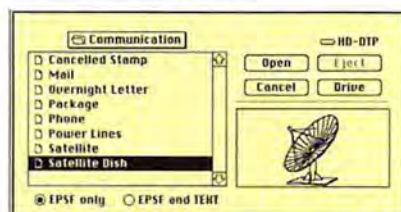


Figure 1: Even with MultiFinder, looking for the right piece of clip art can be tedious when you're using a page-layout program such as PageMaker. Smart Art's preview window in its Open dialog box makes it easier.

Open dialog box and select the file you want to view. The preview window lets you zip through numerous files that are displayed in a reduced-but-still-recognizable size (see Figure 1).

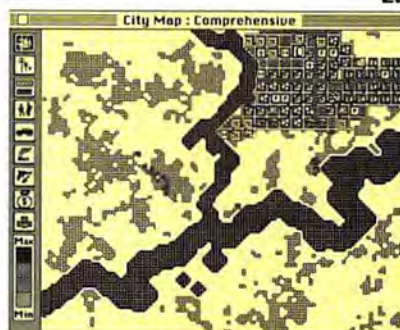
Remember, you're only previewing the art — don't try opening these files in Smart Art.

Robert B. Woodward
Atlanta

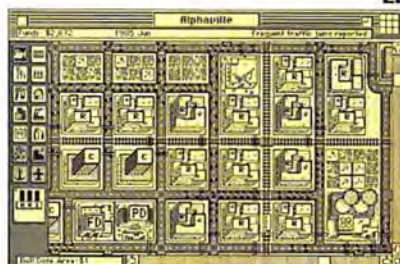
Compiled by Gregory Wasson

SimCity 1.0

2a



2b



Figures 2a and b: SimCity lets LaserWriters print two views of urban sprawl (although the manual claims that it supports only ImageWriter output). You can print either a one-page comprehensive view (2a) or the first page (2b) of the detailed six-page tiled map (which requires an ImageWriter for the remaining five pages).

SimCity 1.0

The SimCity manual and Print dialog box warn that LaserWriter printing is not supported, but that's not entirely true — the LaserWriter can handle part of the job.

When you choose Print City from the File menu, you are offered two choices: to print all on one page, which produces a reduced city map without fine detail, or to print a tiled map two-by-three pages in size that displays buildings, roads, and tracks in all their delightful SimCity complexity (see Figures 2a and b).

If you print to a LaserWriter, the one-page map prints out fine. The tiled-map Print option produces the first section or page of the map, but you have to print the remaining five pages on an ImageWriter.

Ed Houseman
Burlingame, CA

No other hard drive stacks up to Jasmine.

Year after year, Jasmine has set the standards by which other hard disk drives are compared.

Now, in 1989, we've raised those standards. With a new series of DirectDrives™ that are more reliable, affordable, and technologically advanced than ever.

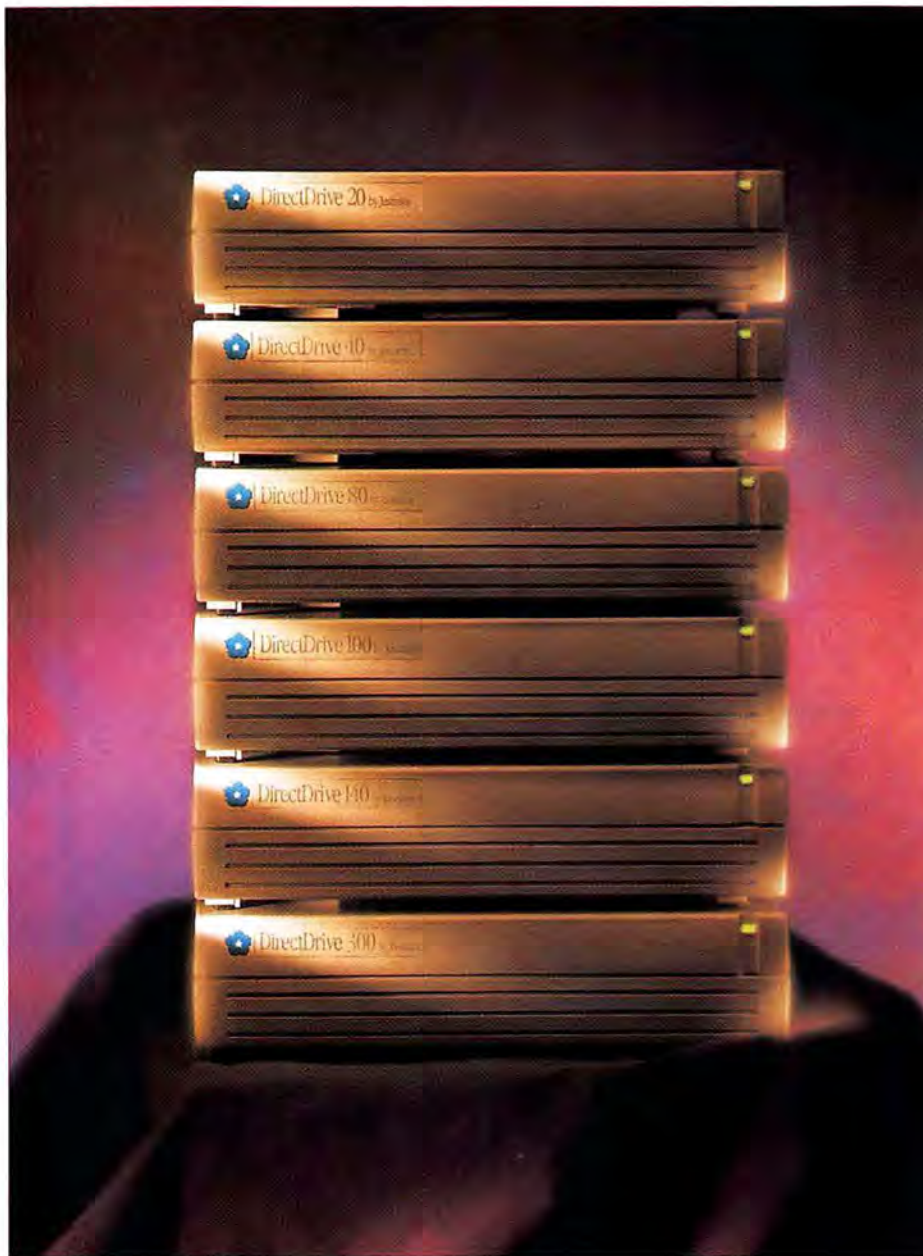
DirectDrive 20	\$549
DirectDrive 40	\$699
DirectDrive 80	\$999
DirectDrive 100	\$1199
DirectDrive 140	\$1499
DirectDrive 300	\$2795

Of course, while continually pushing the boundaries of technology, we've never forgotten that there are some things technology alone can't provide. Like the joy of spending not a penny more than necessary to acquire the very best. Or the satisfaction of owning a hard-working, reliable piece of hardware. Or the feeling of confidence that comes from dealing with a company dedicated to customer service.

So it's only to be expected that this new series of external hard disk drives gives you more than more megabytes for your money. With each 1989 DirectDrive you also receive our exclusive, 30-day money-back guarantee and no-nonsense, two-year warranty.

But that's not all. Jasmine DirectDrives come bundled with over \$500 worth of the most advanced utility software available—absolutely free. Including Symantec™ Utilities for Macintosh, which lets you recover data from a mistakenly-initialized hard disk. Redux™ from Microseeds, perhaps the easiest, most powerful way to back up your data. DriveWare™ and DEScripter™, our comprehensive operating and proprietary encryption tools.* Plus DemoWare™ and over 5MB of Public Domain and Shareware software.

To order a new DirectDrive call 1-800-347-3228 in the U.S. or 1-415-282-1111 worldwide. Our knowledgeable staff is ready to answer your questions Monday through Friday from 8 am to 6 pm (Pacific Standard Time). MasterCard, Visa, or American Express cheerfully accepted.



 **Jasmine**
1-800-347-3228

MacWrite II

The new MacWrite II has a nifty smart-quote feature that automatically converts the typewriter-style single- and double-quote marks (like "this") to the more-professional-looking curly quotes (like "this"). What do you do if you customarily use special foreign quote marks (such as guillemets — like «this» — in French, Italian, and German)?

You can change MacWrite II to be smart in any language by changing the SMQT resource with ResEdit. Open the resource and substitute the guillemets (both single and double) for the curly quotes. The keystrokes for « and » are Option-backslash and Shift-Option-backslash, respectively. The keystrokes for ‹ and › are Shift-Option-3 and Shift-Option-4, respectively. Close ResEdit and save the changes you've made. Now the program will smartly insert the new types of quote marks as you type.

Dave Valiulis
Scotts Valley, CA

Ready,Set,Go! 4.5

An undocumented feature of Ready,Set,Go! is its ability to produce gray-scale characters. Users who cannot afford to produce multicolor newsletters or brochures can use the program's color features to their advantage. By making text different colors and printing without the Color Separation option checked, you can have the program output gray-scale characters on a PostScript printer.

Figures 3a and b show what some of the basic colors look like when displayed on a color screen and when printed in gray scale.

Dave Friedman
Madison, WI

Finder

You can save a considerable amount of horizontal space by resetting the generous tab stops Apple assigns in the Finder.

To do so, run ResEdit and open the Finder on the disk you want to change (make sure you're not running under MultiFinder — you won't be able to do this if you are), open LAYO, open LAYO=ID128, scroll down to the Tab-stop labels, and substitute the following values:

Tab stop 1	20
Tab stop 2	114
Tab stop 3	154
Tab stop 4	208
Tab stop 5	304
Tab stop 6	352
Tab stop 7	384

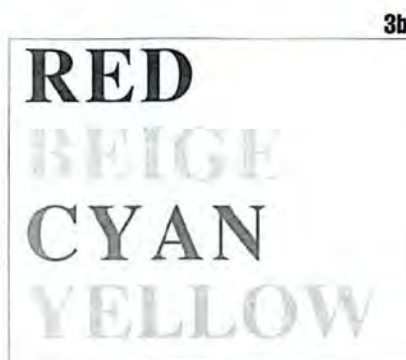
You can change these values to suit your preferences. I find that these values save the most space without obscuring too much of the column's contents.

Charles A. Frean
Groton, MA

Ready,Set,Go! 4.5



3a



3b

Figures 3a and b: If you're a desktop publisher with a Mac II and color monitor but have little interest in or means of producing color publications, you can use the color-text capabilities of Ready,Set,Go! 4.5 (as shown in 3a) to create gray-scale characters (as printed out in 3b).

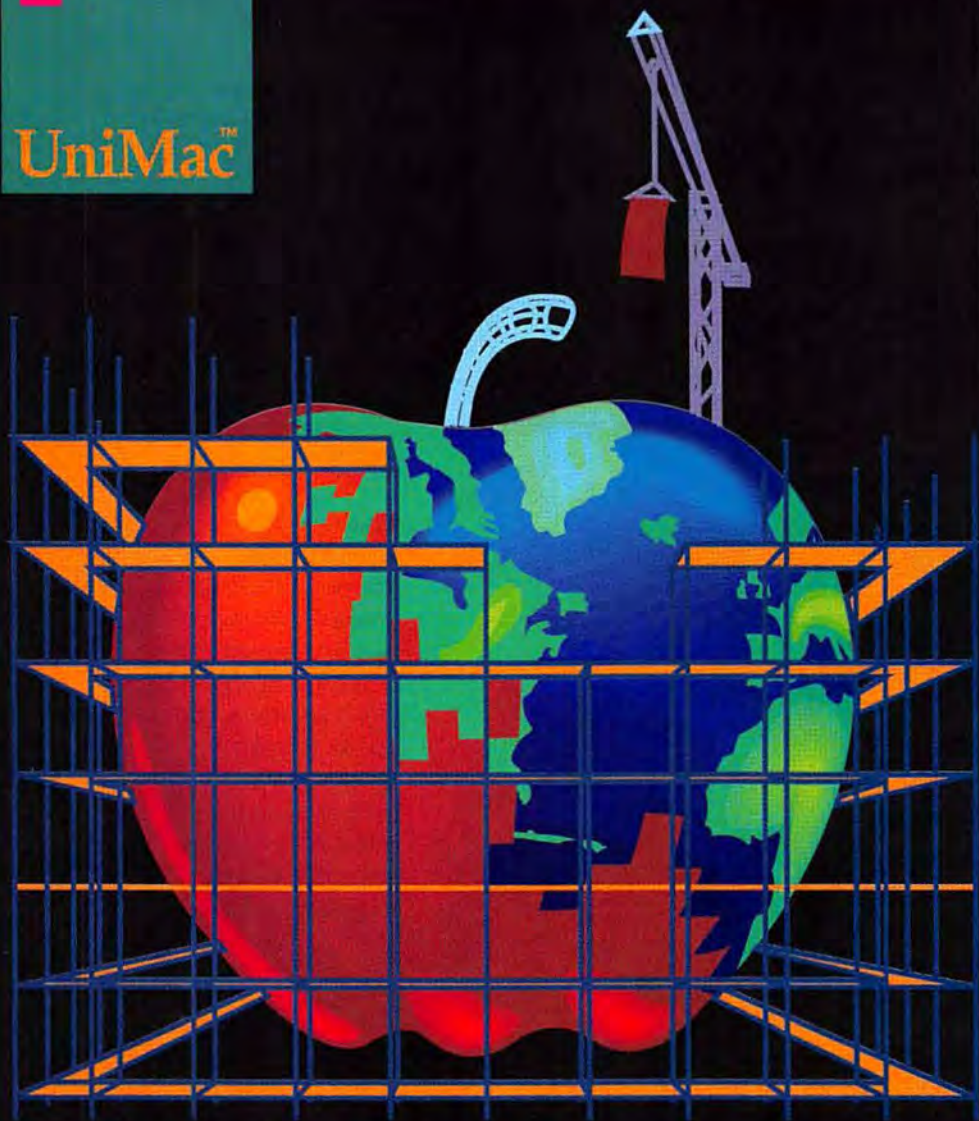
Hard Disks

The performance of your hard disk relates to its interleave factor. If you change machines or add an accelerator card, you may need to change the interleave. As a rule, drives attached to a Mac Plus work best with a 3:1 interleave; those attached to an SE require 2:1; and Mac IIs, IIX's, SE/30s, and all accelerated Pluses and SEs work best if the disk has a 1:1 interleave.

To see what that interleave is and to change it, use the latest version of Apple's HD SC Setup (which is part of the System Tools 5.0 or 6.0 package). Hold down Command-I after you arrive at the application's window to access the interleave areas of the program.

Remember to back up your entire disk before changing the interleave. Changing the interleave requires reformatting the disk — an operation that destroys all the data on the disk.

Steven Bobker
Palo Alto, CA

The UniMac logo features the word "UniMac" in a stylized, orange, sans-serif font. Above the "i" in "Mac" is a small, solid red square. The logo is set against a dark background.

Build Your Own Mac

BYOMSM

Some of the best things
about Apple are the things
they don't do.



Trade secrets revealed...

How To Save Money On Hard Drives and Other Macintosh Products!

Would you like to save money?
A lot of money?

If so, before you go through the pain and expense of buying a hard disk drive for your Macintosh, there's something you should know. It's a trade secret that Apple and others would rather you didn't know.

Just listen to this. Apple only offers three hard drive choices. But, when you know how, you can have an almost unlimited selection.

You can select a 20 megabyte or 600 megabyte – or more – all from major brand name drive manufacturers. You can even purchase the same drive that Apple sells!

What's the secret? Everything that you need to know is explained fully on a diskette titled – **BYOM**.

BYOM is published by UniMac. And, it's yours for just seven bucks! A small price to pay for inside trade information. Wouldn't you agree?

But, that's not all. Included is information on hundreds of products you can buy from other companies that will enhance the value and performance of your Macintosh!

Now, here's the best news of all. We guarantee that this \$7 investment will save you money or we'll double your money back! No kidding. If **BYOM** doesn't show you how to save money on your next hard drive using any of our internal or external kits, we will cheerfully refund you \$14.00!

So why wait? All you have to do is send us your request along with your \$7. Send in your order today – and learn the trade secrets that we've dared to share!

Universal MacProducts, Inc.
942 Calle Amanecer, Bldg. A
San Clemente, CA 92672

Oh, by the way, a full-size poster of this illustration is available from our dealers. Details included with your order. Thank you.

©1989 Universal MacProducts, Inc. UniMac, the UniMac logo are trademarks of Universal MacProducts, Inc. BYOM and Build Your Own Macintosh are salesmarks of Universal MacProducts, Inc. All other product or company names are trademarks of their respective companies. All rights reserved.

Keyboard

There comes a time in the life of every Mac keyboard when one of the keys fails to work. How-to articles describe how to repair the keyboard by breaking out the trusty ol' soldering pencil, tearing the keyboard apart, and replacing the individual key with one purchased from the local Apple dealer. Although this method does an admirable job, you may be uncomfortable doing this kind of minor keyboard surgery.

I have an easier method that requires no soldering. The method is based on the assumption that the key is probably suffering from a dirty contact and that the contact can be cleaned with a judicious application of a solvent.

Disconnect the keyboard from the Mac and carefully pry the key cap off the offending key (see Figure 4a). Now take a can of WD-40 (available at most hardware stores), insert the small straw that comes with the lubricant into the nozzle, and direct as short a spritz of WD-40 as possible at the point where the white key plunger enters the black body of the key (see Figure 4b). Work the key plunger several times and then reconnect the keyboard to see if the key works. The first application of WD-40 may

Keyboard



4a



4b

Figures 4a and b: Sticky keyboard slowing you down? A quick and easy remedy is to carefully pry the offending key off your disconnected Mac keyboard (4a), apply the lubricant WD-40 to the key plunger (4b), and work the key plunger several times. Although the first application of WD-40 may not work, the second or third try usually unsticks your problem key.

not do the trick, but the key should be resurrected by the second or third try. This method has worked for me on three occasions when I've lost a key on my four-year old keyboard.

Michael J. Blotzer
Augusta, ME

Tip of the Month

Word 4.0

Inserting graphics in a word-processing document can significantly increase printing time. Here's a trick for trimming your printing time on working drafts and proofs.

Measure the illustration's height (many object-oriented draw programs have a Show Size option). Insert the graphic into a Word document. With the graphic selected, choose Paragraph from the Format menu. Type a minus sign in the Line Spacing box and then enter the graphic's measurement. The minus sign adjusts the paragraph's height to match the size of the graphic.

Select the graphic again, choose Character from the Format menu, and format the graphic as hidden text. When you print draft documents, be sure Print Hidden Text in the Print dialog box is not selected. The illustrations will be replaced by an appropriate amount of white space, and you'll know where your page breaks are (see Figure 5a). When you're ready for the final version, recheck Print Hidden Text, and the graphics will print properly (see Figure 5b).

Peter Ansin
Santa Monica, CA

5a

The zebra is much overworked — not so much the animal, but the name. First and foremost, it's an animal as pictured below:

You'll also find the zebra fish, not to be confused with the zebra finch. Then there's the zebra crossing, the standard crosswalk.

5b

The zebra is much overworked — not so much the animal, but the name. First and foremost, it's an animal as pictured below:



You'll also find the zebra fish, not to be confused with the zebra finch. Then there's the zebra crossing, the standard crosswalk.

Figures 5a and b: Printing graphics in draft Word documents can be slow. One solution is to use hidden text. In the Paragraph dialog box, enter the height of the graphic as a negative number for Line Spacing, which adjusts the paragraph height to the size of the graphic. In the Character dialog box, set the graphic to be a hidden character. When you print, make sure to uncheck the Print Hidden Text box. Drafts will print much faster, and you'll also have an idea of the space the graphics occupy.

Save enough on one carousel to pay for your Mac II film recorder.



"You mean \$3995 is all I pay for a high-performance Still Light™ digital film recorder? With free camera backs for 35mm slides, Polaroid® instant prints and full-size overheads? With everything I need for high-impact presentations and comps?"

You better believe it. Still Light is the only film recorder that supports Bitstream® fonts. It uses all 16.7 million Macintosh® II colors, and virtually every popular Macintosh software application. Still Light also works with optional 4 X 5 and 35mm motion picture

formats. Don't let other film recorders take

you on an \$11,000 merry-go-round. Call now: 1-213-618-0274—for sample slides, literature or a demonstration. See how Still Light can make your ideas look great without costing you a bundle.



Liquid Light

Still Light is a trademark of American Liquid Light, Inc. Polaroid is a registered trademark of Polaroid Corp. Macintosh is a registered trademark of Apple Computer Corp. Bitstream is a registered trademark of Bitstream, Inc. Copyright 1989 by American Liquid Light, Inc., 2301 205th Street, Torrance, California 90501.

Please circle 1 on reader service card.



Help Folder

Answers to Readers' Questions

Hard to Be Easy

Half a dozen readers, including Sulin Hazari of Morgantown, West Virginia, point out that in the May '89 Help Folder, the PostScript program to turn off the test page doesn't work. The bug is in line 3, which should read `false setdostartpage` instead of `dostartpage false`. Honestly, I copied straight from Apple's technical-support library...

And many others (including Gary Wilt of North Riverside, Illinois) recommend simply pulling the paper tray out while the printer is warming up. No paper, no test page. Sometimes I'm embarrassed by simple solutions.

Slow LaserWriter SC

Q. I have a Mac II with 5 megabytes of RAM and a Rodime 45-megabyte hard-disk drive. My printer is a LaserWriter IISC, and I'm using System 6.0.2. I use this computer extensively at work. Overall, I am very happy with it; much of the negativity surrounding the LaserWriter IISC is, I think, unwarranted. It's fast, and the quality is good.

I do have a couple of problems, or really annoyances, though, that you might be able to help me solve. One is background printing: Whenever I print a document, other operations (such as editing another document) slow down to a snail's pace. This slowdown doesn't make sense to me. I realize the CPU has to handle background printing, but why can't it operate as a spooler?

Also, during printing from Cricket Graph, the vertical legends are in ImageWriter quality. Would these difficulties be corrected if I printed graphs on a PostScript printer?

Phillip Berger
Moscow, ID

A. Unlike the other LaserWriters, the LaserWriter IISC doesn't have an on-board computer running PostScript to help it print the massive number of dots on a laser-printed page. Essentially, the SC is a 300-dot-per-inch (dpi) ImageWriter that communicates through SCSI rather than a serial port. The volume of data is one reason your machine

slows down during background printing. The Macintosh is spooling: The application is saving its pages into a "spool file" on the hard disk, and later the PrintMonitor takes the pages out of the spool files and sends them to the printer, which naturally

slows performance of other operations. With the SC, it's worse, both because more data is being moved around and because the SCSI bus is being used twice (once to get the information from the disk and again to send it to the printer).

The LaserWriter NT and

Are All Modems Created Equal?

Q. I need a modem for very basic communications between home and a small law firm. The software and information require only a 1,200- or 2,400-baud Hayes-compatible modem. I was looking at a few modems, including the Hayes Smartmodem, an Everex modem, and a U.S. Robotics Courier modem. Voice/data switching would be nice, but it is not necessary. Should I buy a modem on price, or does quality make a big difference?

Brady Ryall
Winnipeg, Manitoba
Canada

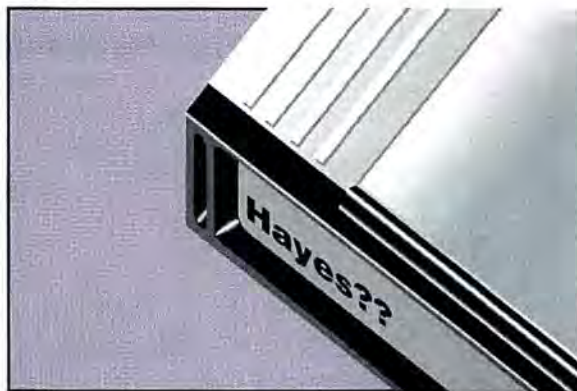


ILLUSTRATION: MARK W. SWEENEY

A. Thanks to the standardization of the Hayes Smartmodem command set, you're pretty much free to choose a Smartmodem-compatible modem on its price, warranty, and manufacturer's reputation. As with most products, quality of manufacture makes a difference, and the little design features (such as the swiveling power connector on the Prentice Popcom modem I use) count for something.

But beware: "Hayes-compatible" is a pretty

loosely used phrase. Not all applications use the Hayes command set correctly, and not all modems implement it consistently. My modem requires uppercase characters in commands and has a 40-character command-line limit (which makes it difficult, for example, to place a long-distance modem call charged to an MCI or Sprint card).

Before you buy a modem, it's a good idea to check it out with your telecommunications software.

By Chris Espinosa

"The Analyst exceeds every other integrated Macintosh package by several orders of magnitude."

MacUser, July 1989

It's no secret that Macintosh has gone a long way toward helping you manage the chaos created by today's information explosion. Now there's an integrated software package that lets your Macintosh really go the distance. It's called the Analyst.

But don't just take our word for it. Listen to some of the kudos being paid to "Xerox's astonishing software solution" in MacUser.

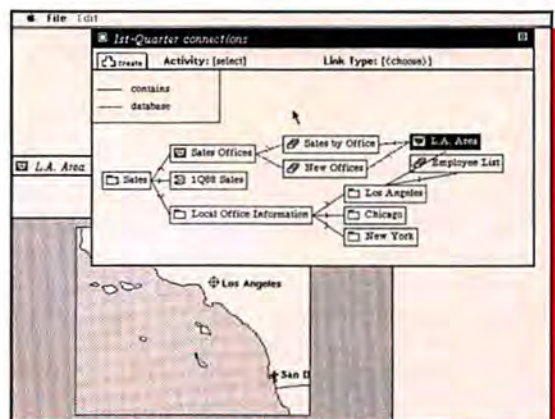
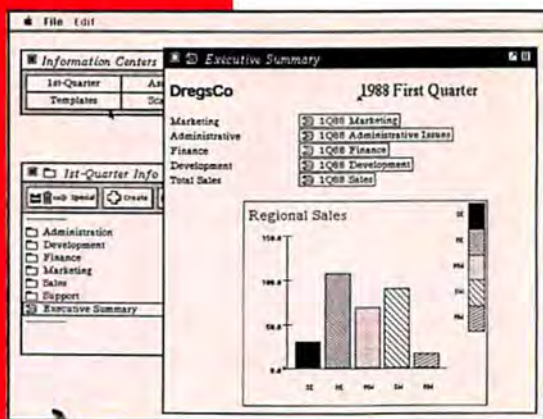
"The program's level of integration and power is staggering."

No other software tool creates a richer, more comprehensive environment for managing information with your Mac.

The Analyst combines spreadsheets, business graphics, documents, maps and images, forms, databases, communications and desktop publishing into multiple windows. So you can perform a variety of tasks, all in a single session.

What's more, the Analyst lets you logically link any item of information with any other throughout the entire system—without having to remember where it was stored.

The Analyst performs this task by organizing large collections of data into *Information Centers*. So you can retrieve the exact item you need by using everything from keywords, data types and text strings—to creating your own unique system of *links*.



"There's no question that Xerox SIS has defined a new level of Mac software."

As most people know, the Mac's technology was pioneered at Xerox. Now, thanks to the Analyst, the company that set the standard is raising it again.

In addition to Macintosh, the Analyst is compatible across a wide variety of platforms including IBM 386 and Unix workstations.

So if you or your customers want to turn your Macintosh into the ultimate management tool, call Vista Marketing toll-free in the Continental United States. 1-800-233-9055 (In California 1-818-351-2351). Or write Xerox Special Information Systems, P.O. Box 5608, MS 520, Pasadena, CA 91109.

The Analyst
How did you ever manage without it?

Xerox® and the Xerox product names identified herein are trademarks of Xerox Corp. Apple® and Macintosh are trademarks of Apple Computer, Inc. IBM is a registered trademark of International Business Machines. Unix is a registered trademark of AT&T Corporation.

Please circle 73 on reader service card.



NTX cause less disruption during background printing because they use PostScript, which is a more compact representation of the data, and also because the data comes in the SCSI port and goes out the AppleTalk port. PostScript also has the advantage of being able to rotate text in high quality, and applications such as Cricket Graph can take advantage of that when you're using a PostScript printer.

QuickDraw, inside the Macintosh, can't draw rotated text. The way Cricket Graph draws rotated text on the screen

and on non-PostScript printers is to draw the text off-screen, take a "picture" of it, rotate the picture, and use it to label the graph. This picture of rotated text is at ImageWriter quality—72 dpi. And since you get a picture, not real text, the LaserWriter IISC driver can't substitute its high-resolution fonts when the page is spooled and printed.

Dumping Text from Filevision

Q. There seems to be no provision in Filevision 1.0 to create a text file. The only

way to get data out, as far as I know, is through a printer. I have a lot of data in Filevision that I would like to transfer to a HyperCard stack.

Do you know of any program that can replace a printer driver with a file creator? Or possibly a spooler that preserves a file that can be reread by a HyperCard script?

M. L. Charters
Cambria, CA

A. My favorite is SuperGlue II (\$119.95 from Solutions International, 30 Com-

merce St., Williston, VT 05495; (802) 658-5506). Almost any application that prints on an ImageWriter can work with SuperGlue. The purpose of SuperGlue is to capture output destined for the printer and save it in a file that you can copy from, send to someone else, or open later without having the original application around. It also lets you capture the text from a printout and save it in a text file. I use it a lot to capture text from PowerPoint, which also doesn't export text files.

A neat feature of Super-

Where No Courier Has Boldly Gone

Q. While preparing transparencies for my statistics course, I ran into the following problem. I was working with histograms, output from a program called Minitab, captured during an interactive run. Minitab uses spaces and asterisks to create graphics, so I converted the output to Courier. When the histogram output is bold, the columns do not align correctly; in plain text, they're OK. This happens consistently in both Word and WriteNow, even though what's on the screen looks fine, whether it's plain or bold.

S. David Farr
Buffalo, NY

A. QuickDraw creates bold characters by "smearing" each letter one pixel to the right, which makes each bold character wider. That looks fine on the screen and on a low-resolution printer, but a pixel width's worth of boldfacing looks grotesque on documents produced on a laser printer or other typographical device. A bold character on the LaserWriter is only slightly wider than its plain equivalent, not nearly a whole point wider.

Here's where you run into a discrepancy: A bold word printed on a LaserWriter is not as wide as it is on-screen. The LaserWriter driver could

add space between the printed letters to match the screen, but that would look really ugly. So instead, the driver adds space between each word and its neighbors to compensate for the difference between the screen and printer widths. The amount of extra space it adds is proportional to the number of characters on the line.

So, in your histogram example, because each line has a different number of asterisks, each gets a different amount of space between words, which is why your columns don't align.

There are two workarounds. Both Word and WriteNow support fractional width spac-

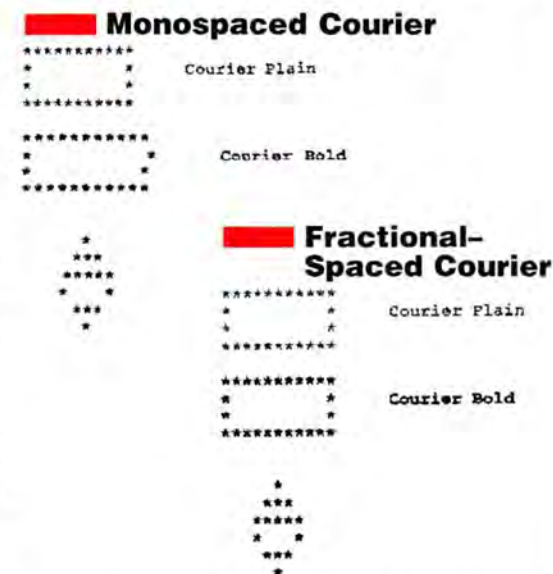


Figure 1: Bold characters in the monospaced Courier font don't align correctly on a laser printer (a). Word and WriteNow support fractional spacing, which solves the problem (b).

ing with high-resolution printers, which optimizes character spacing for printing and should fix the alignment problem (see Figure 1). Word calls this approach Fractional Widths; in Word 3 the option is in the Print dialog box, and in Word 4 it's part of the Page Setup dialog box. In WriteNow you select it in Page Setup by checking "Use printer spacing." The other workaround is to replace the space runs with a single tab and set tab stops.



To get the most out of this box, you need to get this box.



Now that you've had the good sense to put a Macintosh® in, may we suggest something sensible to put in your Macintosh.

The Microsoft Office. The essential tool set designed expressly for business professionals.

It's four of the most successful programs to ever light up a Macintosh screen, in one specially-priced box. Including Microsoft® Word 4.0, the best-selling word processor in Macintosh history.

Microsoft Excel 2.2, a powerful new version of the industry standard already used by 90% of Macintosh spreadsheet users.

Microsoft PowerPoint®, the program that lets you turn routine slides, overheads and audience handouts into visual masterpieces.

And Microsoft Mail, the smartest, most efficient route for office communications.

All of these applications work brilliantly alone. And even better together. Thanks to innovative features like Excel/Word warm links, shared user dictionaries and mail integration.

And since your work group will need all four of these programs sooner or later, you'll want to buy them sooner. Because for a limited time, The Microsoft Office is priced 35% below what the same products cost individually.

So now that you have the computer that has everything going for it, get it everything it needs to get going. The Microsoft Office.

For more information call (800) 541-1261. Or stop by your Microsoft dealer today.

Microsoft®
Making it all make sense®

Customers inside the 50 United States, call (800) 541-1261. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. © Copyright 1989 Microsoft Corporation. All rights reserved. Microsoft, the Microsoft logo, and PowerPoint are registered trademarks and *Making it all make sense* is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Offer good through December 31, 1989.



Glue is that you can save an Image File (a picture of a printed page), open that file with the Viewer DA, and select a rectangle of text to paste into another application. So if you have columns of data in a word processor and you want to extract just one column, use SuperGlue, open the Image File, select the column, and copy the text. Then you have only the column you want.

Another option is to upgrade your version of Filevision to Filevision IV, which does import and export data. For more information, contact Filevision's publisher, Marvelin Corp., at 3420 Ocean Park Blvd., Suite 3020, Santa Monica, CA 90405; (213) 450-6813.

Layering Disk Labels

Q. I have about a dozen 3.5-inch disks with outdated labels. After I peel and scrape all of the paper label off, the adhesive remains. I have unsuccessfully tried to clean away the sticky surface with a few household cleaners, rubbing alcohol, and nail-polish remover.

Any recommendations for something to remove the adhesive? It seems like a shame to just trash the disks. What about placing a new label over the old one?

Troy Biles
Coralville, IA

A. By all means, pile up the labels! As long as the new label completely covers and adheres to the old one (and doesn't leave a sticky flap), you can

Desperately Seeking Specs

Q. I can't locate anyone who has sound knowledge of the Mac hardware architecture or find any sources of information about it. I have dealt with several brands of computers throughout my career, but I am unfamiliar with the Mac's internal structure. Therefore, I hesitate to make any modifications to existing systems. Is there a brochure, book, or reference in which I can see labels of what goes where or how to replace memory chips, devices, and so forth?

Karl A. Shump
Durham, NH

A. The *Macintosh Family Hardware Reference* outlines the internal architecture of the Macintosh 128K, 512K, 512KE, Plus, SE, and II computers. It describes the basic workings of the processor, memory, I/O, and bus circuitry and includes pin-

outs of all internal and external connectors.

Written by Apple and published by Addison-Wesley, it's available in most technical bookstores (ask for the Apple Technical Library from Addison-Wesley) and from APDA; (800) 282-2732.



Nisus. The word heard around the world.

Sang Chaul Shin: Software Engineer, Seoul, Korea
Business: Elex Computer, Inc.
Word Processor: Nisus™

I like the Nisus word processor very much. Many others must like it too, because Nisus will be supplied with every new Macintosh sold in Korea.

Nisus is replacing the word processors Koreans use now because it is so powerful. Desktop publishers and business people really like it. There are many menus so you can be complicated or easy.

The macros and Easy Grep are especially good because Koreans like to have as many functions as possible. Another thing Koreans like is the graphic support. With MS Word, there was no support. Nisus puts graphics right in the text.

Nisus is - what is the word? - Amazing!

Nisus (nī 'sus): 10 clipboards, 32,000 undos, text pattern search/replace, footnotes/endnotes, open/closed file search, programmable macros.

PARAGON
concepts, inc.
We make good ideas work.

990 Highland Dr., Suite 312, Solana Beach, CA 92075
(619) 481-1477 Outside CA call toll-free (800) 922-2993

Please circle 107 on reader service card.

\$5000 value included...Discount coupons for Mac hardware/software!

VersaCAD On The Macintosh— A Winning Performance

VersaCAD/Macintosh Edition — Under \$2000

2D drafting ■ 3D visualization ■ CAD translators ■ HyperCard bill of materials, database, parametric design, etc.

VersaCAD Drafter — Under \$1000

Full production drafting capabilities*



"Provides one of the most important qualities in any design and engineering operation: versatility" — MacWeek

"The standard of comparison for Macintosh CAD programs... the clear leader" — Architecture

"Software powerful enough to really push the limits of the hardware it runs on" — PC Week

"1988 Product of the Year" — Infoworld

"Best 2D, Best Mechanical CAD" — National Computer Graphics Shootout

"1989 Editor's Choice for Best New CAD/CAM Package" — Muller

"A full featured drafting tool that is well suited for a broad range of applications" — Byte

See VersaCAD Macintosh Products demonstrated at MacWorld / Boston, booth #5145.

Versacad Corporation, 2124 Main Street, Huntington Beach, CA 92648. (714) 960-7720.
Please circle 103 on reader service card.

Prime



stack two or three new labels on top of an old one. At some point the stack will get too thick. Then it's time to scrape carefully through them and get close to bare plastic to stick on another. It doesn't have to be neat as a pin; no close-tolerance mechanical parts care about the label thickness.

But a lot of parts *do* care about the integrity of the disk, the metal shutter, and the plastic disk casing. Scraping can bend the metal and cause the shutter to stick—which makes the disk stick in the drive. Nail-polish remover can melt the plastic and dissolve the floppy disk. Never use any solvents on a disk. [You might also try *LabelOnce Erasable Labels* from Multicomp, Inc., P.O. Box 2761, Abilene, TX 79604; (915) 676-0844. —Ed.]

Two Rumors

Q. A friend uses the programmer's switch on the side of the Mac for emergency reboots when it bombs or hangs (normally you turn the Mac off). Is this safe?

I have an ImageWriter II, and I've heard it's not a good practice to roll paper through it manually when it is on. Is this also not a good thing?

Kyle G. Murphy
Federal Way, WA

A. The same Reset signal gets sent to the Macintosh if you turn on the Macintosh or press the Reset half of the programmer's switch. So if the Macintosh has truly crashed, the Reset switch is just as safe (in fact, a little

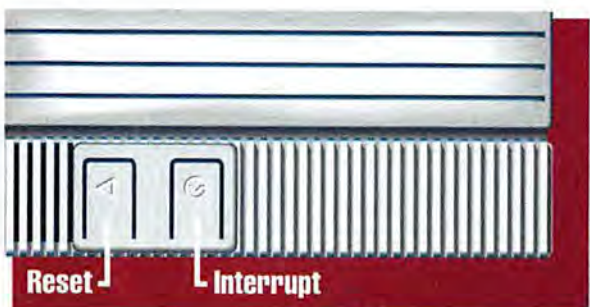



ILLUSTRATION: MARK W. SWEENEY

nicer, because it puts less stress on the power supply and other circuitry). If you have Macsbug installed, I'd recommend pressing the Interrupt half of the programmer's switch and typing `es` — for Exit to Shell. In some cases doing so returns you to the Finder, where you can choose Restart. The advantage of this method is that the Finder has a

chance to shut the file system down nicely, which reduces the risk of damaging disk files.

I've never heard of problems rolling paper through an ImageWriter II manually. Just make sure to deselect the printer, and make sure the top of the page is aligned under the paper bail when you reselect it. 

POWER UTILITIES FOR POWER USERS

Allocate and secure power with

Hard Disk Partition v3

Hard Disk Partition™, the most popular partitioning utility for the Macintosh®, has just gotten better. Partitions reduce fragmentation and desktop updating times, and are now resizable. Secure important files with password-protected partitions that can also be encrypted on-the-fly. Prevent virus infections with read-only protection. Hard Disk Partition can even copy protect programs on your hard disk, preventing software theft. Optional administrator-override password system for multi-user environments is also available. AppleShare® and TOPS™ compatible.

Enhance the power of your Macintosh with FWB's family of power utilities. Because as a power user, you cannot afford to waste any of your Mac's potential. FWB utilities are available through your local dealer. For more information, contact us at (415) 474-8055.

Energize your hard disk with

Hard Disk Toolkit

Hard Disk ToolKit™ replaces your hard disk's original installer with a powerful SCSI utility package providing advanced functionality. Create true SCSI partitions. Disable your drive with low-level password protection. Test your disk with extensive benchmarks and comprehensive diagnostic tools that detect and correct media errors. SCSI drivers hand-tuned by experts can enhance the performance of your hard disk. Hard Disk ToolKit supports SCSI drives including removables and will increase the capacity of Apple drives by 1 to 10 MB. A/UX® compatible.

Conserve your energy with

Hard Disk Jockey

Hard Disk Jockey™ extends the standard desktop by adding a much more effective organizational alternative. Display, select, search, and manipulate files on a more intuitive global level. Display the disk volume in its natural graphical hierarchy. Select files with your mouse or according to filename, wildcard, date, color, or type. Organize and purge files and folders efficiently. Locate files using multiple search criteria quickly with the advanced RAMfind™ routine. Browse through text and graphic files without running their native applications.



XCEED™ YOUR MEMORY LIMITS



With the demands of today's software, you need memory products that exceed your existing system memory and enhance the sophisticated features of your Macintosh®.

That's why we developed our Xceed™ Memory Expansion Kits — to provide maximum speed and performance for memory-hungry operating systems, power spread sheets and graphics programs, and to add flexibility when running software programs such as MultiFinder™.

Xceed Memory Kits provide an additional 1 to 8 megabytes of RAM for your Macintosh Plus, SE, SE/30, II, IIx or IIcx. They feature fast, low power

CMOS* SIMM modules populated with superior quality DRAMs. Plus they're backed by our comprehensive service and warranty program.

So contact us today at 1-800-642-7661 for the name of your nearest Micron dealer. And start Xceeding your memory limits.

Micron. Working to improve your memory.

OEM standard and custom inquiries welcome.

* 256K SIMM modules are NMOS technology.

Xceed is a trademark of Micron Technology, Inc. Macintosh is a registered trademark, and MultiFinder is a trademark of Apple Computer, Inc.



MICRON

TECHNOLOGY, INC.

2805 E. Columbia, Boise, ID 83706 (208) 386-3900

Please circle 81 on reader service card.

See us at MacWorld EXPO/
Boston, Booth #208
Bayside Expo Center



■ EDITED BY
AILEEN ABERNATHY AND
SALVATORE PARASCANDOLO

Jagged, bit-mapped screen fonts will soon be history thanks to new outline-font strategies being developed by Apple and Adobe. This month's Fine Print discusses the options and highlights solutions that are already available. Our Desktop Tutorial shows you how to use the PostScript commands in Word 4.0, and we offer a Desktop Tip on recovering Illustrator files from PageMaker and other programs.

FINE PRINT

Elefontitis

You have large type in your page-layout document and need a decent screen image. Instead, you see jagged, off-size headlines. Cheer up. There are new cures available with Apple's System 7.

The Mac is a WYSIWYG machine in most respects, except with fonts used at the "wrong size." You've seen text that prints well on a PostScript printer but looks jagged on-screen and when printed on an ImageWriter. It happens because the good-looking, PostScript-printed stuff comes from mathematically defined *outlines* of each character. These shapes increase or reduce size flawlessly, but screen text comes from paintings or *bit maps* of each letter, called a *screen font*.

Screen fonts don't resize well, so ideally you should have a screen font for each point size you use. You probably have point sizes such as 9, 10, 12, 14, 18, 24, and maybe 48 on hand. But if you want to use, say, 107 points, for which no screen font exists, you get a resized version of an existing screen font that's been hammered to fit.

Apple has announced a new outline-font technology that should solve that problem sometime in early 1990. Adobe is also developing a solution that should be available this fall. (Both Apple's and Adobe's approaches will require 2 megabytes of RAM.) QuarkXPress 2.1 offers relief right now, and FontSizer has been serving as an interim plane toward screen-

font Nirvana. If you want to WYSIWYG wisely, here's the scoop.

The Solution Outlined

Since font outlines are so versatile, we should abandon bit maps and use outline fonts for both screen and print. Outlines can be resized and displayed with great fidelity to the original typeface. Screen fonts of any size (12, 22, 99, 116) are available in any application. With better visualization and size flexibility, you may be inspired to use large display type more frequently, in odd sizes and in more creative ways. Low-resolution devices earn new respect because their text output comes from smooth outlines.

U.S. MicroLabs markets FontSizer, a utility that produces precisely sized bit-mapped screen versions of any PostScript outline font in sizes from 12 to 127 points. (Actually, the utility orders an Adobe PostScript printer to do it for you.) Provided you have access to the printer, this scheme is inexpensive. These custom screen fonts are usable by all programs. You must, however, create all the screen fonts you need while keeping an eye on disk space—a single font in a large point size can exceed 100K.

If you need typographic WYSIWYG for page layout and haven't bought a page-layout program, consider QuarkXPress. Version 2.1 offers outline-based screen fonts. Although you can use fonts from any vendor in QuarkXPress, the screen-font WYSIWYG feature works only with Type 3 (unencrypted) fonts, which excludes Adobe's type library.

Making Your Own Screen Fonts



FontSizer is a utility program that creates bit-mapped screen fonts from your PostScript font outlines. It needs the help of an Adobe PostScript printer to do the imaging.

.....
If you have a few tricks of the trade to share, send 'em to
DTP, c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404



Apple's Outline Fonts

Apple's System 7, scheduled to ship in early 1990, will offer outline-font capabilities for both printing and screen display. The new font format is optimized for rendering accuracy and display speed. Apple claims that access to outline fonts will be automatic and totally transparent to existing programs. With System 7's Layout Manager, you'll see sophisticated typographic effects such as kerning and ligatures. However, applications will need to be upgraded to take advantage of these effects.

Apple's fonts will print well on a wide variety of non-PostScript devices—from the ImageWriter to the LaserWriter IISC—at any resolution. On the other hand, they'll require translation (by a conversion utility Adobe plans to develop) before printing to a PostScript device such as your friendly LaserWriter.

Apple will supply a basic set of fonts

in its format. The technology is public, and vendors that plan to offer typefaces in the Apple format include Adobe, AGFA Compugraphic, Bitstream, Casady & Greene, Kingsley/ATF, and URW. Type-manipulation software such as LetraStudio and TypeStyler will be upgraded to work with Apple's font format. Fortunately, with System 7 you can continue to use both PostScript and bit-mapped fonts. With the right combination of utility software, your system should be able to handle any mix of font technologies.

Banking on Adobe's ATM

Adobe Systems will dispense some systemwide relief this fall with its Adobe Type Manager (ATM). Much like Apple's System 7, this transparent utility will provide the benefits of outline screen fonts to all applications. ATM is designed to work primarily with Adobe-compatible (Type 1 or encrypted) fonts.

Fortunately, several type vendors are now licensed to produce them. Adobe is also investigating ways for ATM to support Type 3 fonts supplied by such companies as Bitstream and Kingsley/ATF.

ATM will work with both System 6 and System 7. Moreover, ATM will let upgraded applications access Apple's System 7 Layout Manager. For ATM to work, your System Folder must contain the PostScript outlines of any fonts you're likely to use, even fonts that are resident on your printer. PostScript effects such as fill and stroke will be printed but may not appear on-screen.

What about printing to non-Adobe PostScript devices? ATM will use outline fonts for output to low-resolution printers such as the ImageWriter family but not to high-resolution devices. Adobe doesn't want to muscle in on its own market by supplying non-PostScript printers with clean Adobe outlines.

A Toolkit for the Graphics Professional

We believe that nothing in life should be more difficult than it has to be. And that doubly applies to computers. By adding the right tools, you can make your work both easier and more productive.

The Curator™ manages your art collection and converts artwork into different file formats.

Different paint and drawing programs store graphics in a number of ways. And unless your program speaks that

file's particular language, it can't read it. EPS, PICT, TIFF—we shouldn't have to memorize this alphabet soup. The Curator simplifies life for you by acting as a multi-lingual interpreter.



The Curator handles Mac EPS, IBM, EPS, PostScript, TIFF, PICT, Paint, and Glue formats. But don't worry. The Curator remembers all this for you.

With a name we'd better

Make notes on your layout with GlueNotes, the electronic equivalent to those ubiquitous Post-it notes.

*New Version
SuperGlue II
with GlueNotes*

to a picture that doesn't already have it, it can translate almost any standard format graphic into any other. It also catalogs all of your graphics, in these standard file formats. So you can find the artwork you need easily by thumbnail sketch, name, or keyword.

SuperGlue II™ with GlueNotes™ creates an electronic printout

While it can't add PostScript® or objectness







What About Service Bureaus?

If you depend on a service bureau for output, you should do as your bureau dictates, at least for out-of-house printing. Regarding Apple fonts, some service bureaus are spooked by visions of new font discrepancies. Others welcome the birth of the WYSIWYG screen font, because it increases their customers' appreciation for typography and may encourage greater use of bureau services. Bureaus already have PostScript-based systems that work. Unless they see profitable demand, there's little motivation to support Apple fonts and make major system changes.

By the time System 7 is released, more factors — prices, upgrade policies, and compatibility and performance data — will be known. Any font setup you have should work when you move to System 7, so you'll have the opportunity to adjust your font strategy. ☞

— Salvatore Parascandolo

Options for WYSIWYG Screen Fonts

Type of outline font	System 6	WYSIWYG capabilities
 PS Type 1	→ Adobe Type Manager 9/89	→  Freely resizable outline screen fonts
PostScript Type 3	→ QuarkXPress	→  Freely resizable outline screen fonts
PostScript Type 3	→ Other Applications	→  Limited to available bit-map screen fonts
Type of outline font	System 7	WYSIWYG capabilities
 Apple Format	→ Apple Scalable Font Manager 1/90	→  Freely resizable outline screen fonts

Under System 6 you can use Adobe's Type Manager to have freely resizable screen fonts on the fly from PostScript Type 1 outlines. QuarkXPress now offers resizable screen fonts on demand, but only from PostScript Type 3 (unencrypted) outlines. System 7 will support all of the above and add built-in font scaling of Apple's new outline fonts.

like Solutions, have them.

of almost any document, which can be viewed and annotated without the original application.

Let's say you've just finished a layout and submitted it for approval. You send your supervisor an electronic printout (a computer file that looks exactly as if you printed it). After review, they make comments directly on the SuperGlue file (using a computer version of Post-it® notes).

Hail! Hail! SmartScrap & The Clipper were named best new desk accessories for 1987 by MacUser magazine.



Or try this. You want to incorporate a fully formatted, multi-page spreadsheet in your report. You use SuperGlue to make an electronic printout of it and, using normal cut-and-paste, simply "glue" it as an object-oriented graphic into your document.

SmartScrap™ improves upon the Apple Scrapbook and The Clipper™ adds cropping and scaling tools.

Adobe Systems, Inc.



OK, SuperGlue II won't fix china. But it will allow you to create electronic printouts of just about anything.



Keep an electronic X-Acto® knife handy for cropping and scaling pictures with The Clipper.

SmartScrap picks up where the Apple scrapbook left off, with multiple scrapbooks, scroll bars, a visual Table of Contents, and Marquee and Lasso. **The Clipper** provides cropping and scaling tools to any program you're using.

Solutions

INTERNATIONAL

Available from your dealer or Solutions International, 30 Commerce St., Williston, VT 05495, (802) 658-5506

Please circle 163 on reader service card.

Suggested retail prices: SuperGlue II — \$119.95; The Curator — \$139.95; SmartScrap & The Clipper — \$89.95.

Unique.

Suddenly, everyone's a publisher. Your reader has stacks of newsletters, reports and publications that will go unread. You need to be sure that every publication you create works as hard as you do to get your message through.

You need a new tool that can create unique and effective publications, within budget and on time. One that doesn't require a Ph.D. to operate.

QuarkXPress® 2.1 is fast, powerful page design software created specifically for graphic designers. With commercial-quality typography, professional color support, and integrated word processing, QuarkXPress blends simplicity and productivity into a potent, unique design tool. Designers wouldn't have it any other way.

MacUser magazine calls QuarkXPress "the most powerful page layout package for the Macintosh."

Let the unique power of QuarkXPress give you new creative options and a business advantage.

800-356-9363

Ask for Department A.

Please circle 87 on reader service card.



Quark™

Quark and QuarkXPress are registered trademarks of Quark, Inc.

PANTONE® is a registered trademark of Pantone, Inc. *Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Process color reproduction may not match PANTONE®-identified solid color standards. Refer to current PANTONE Color Publications for the accurate color.

Quark, Inc. • 300 South Jackson, Suite 100 • Denver, Colorado 80209





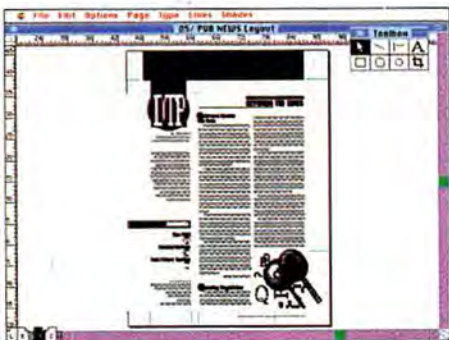
Illustrator

Have you ever lost an Adobe Illustrator file but still have a PageMaker document that contains the missing graphic? Or maybe you need to change some placed art, but the layout was done elsewhere and the original artwork is unavailable. In either case, you can convert the graphic back into an Illustrator document by following the steps below. (Although we are using PageMaker as our example, this technique lets you pull Illustrator drawings out of most programs if you hold down Command-F while clicking on OK in the Print dialog box.)

Step 1

Make a PostScript file containing the graphic you want to convert back into an Illustrator file.

To do this, open the PageMaker document and move the graphic to a blank page. Choose Print and set the page range to just the page that has your graphic on it. Hold down the Option key (or Command-F) and click on OK. The PostScript Print Options dialog box will appear. Select only "Print PostScript to disk" and "Normal." Click on "Set file name" and save the file. The result is a text-only file containing the PostScript code that describes that page.



Step 2

Open the PostScript file and find the code used for the Illustrator drawing.

Use any word processor—Word, MacWrite, or MindWrite, for instance—that can handle large files (larger than about 32K). Search for the text string

Creator:Adobe Illustrator and then go back one line of text. This line includes the string

%!PS-Adobe-2.0 EPSF-1.2 and is the first line of the description of your graphic.

The end of the code sequence depends on which version of Illustrator was used to create the image. For Illustrator 1.1, the end of the text block contains the two lines %%Trailer and E end Illustrator 88 art ends with these two lines:

```
Adobe_cshow /terminate get exec
Adobe_cmykcolor /terminate get exec
```

After you locate this section of code, delete all the text before and after it. Be sure to delete any extra lines or spaces before and after the block of code. Remember: The first line of text should read

```
%!PS-Adobe-2.0 EPSF-1.2
```

Step 3

Save the code in a form that Illustrator can read.

After you have reduced the document to just the Illustrator code, save it as plain (ASCII) text. When naming the file, add the suffix "-ill" for an Illustrator file or "-ill88" for an Illustrator 88 file and then click on OK. (The suffix will help you remember what type of file you recovered.)

Step 4

Open the file in Illustrator.

Launch the correct Illustrator version for the graphic you have recovered. (Illustrator 1.1 cannot read Illustrator 88 files.) Open the text file. If you've done everything correctly, you should have the drawing back in an editable form. Resave the file, and it will appear as an Illustrator document, not a generic text file.

—Tom Wernsman and Salvatore Parascandolo

```
100 div 1440 mul 300 div 20 mul dup 1570 mul exch 147 mul
translate 20 20 scale 0 4226 mul 272 div neg 0 3699 mul 251 div
neg translate 4226 272 div 3699 251 div scale 0 0 moveto 0 251
lineto 272 251 lineto 272 0 lineto closepath clip newpath 0 0 PS-
Adobe-2.0 EPSF-1.2
%%Creator: Adobe Illustrator 88(TM) 1.8.3
%%For: (Mark W. Sweeney) (MacUser)
%%Title: (Dtp June)
%%CreationDate: (2/24/89) (3:26 PM)
%%DocumentProcSets: Adobe_packedarray 0 0
%%DocumentSuppliedProcSets: Adobe_packedarray 0 0
%%DocumentProcSets: Adobe_cmykcolor 0 0
%%DocumentSuppliedProcSets: Adobe_cmykcolor 0 0
%%DocumentProcSets: Adobe_cshow 0 0
%%DocumentSuppliedProcSets: Adobe_cshow 0 0
%%DocumentProcSets: Adobe_customcolor 0 0
%%DocumentSuppliedProcSets: Adobe_customcolor 0 0
%%DocumentProcSets: Adobe_pattern 0 0
```



"SuperCard Dazzles"

—MacWeek Extra, January 20, 1989

"A wilder card...SuperCard most likely gives you all you've been dreaming of and a lot more..."

—MacUser, March 1989

"...clearly evolutionary..."

—The New York Times,
January 31, 1989

"If HyperCard is an
erector set,
SuperCard
is like having an
open account at
Caterpillar."

—Stewart Alsop,
PC Letter, January 1989

"One of the most beautiful
products I've seen in a
long time."

—Jean-Louis Gassée
January 18, 1989

Suggested Retail Price: \$199

Please circle 172 on reader service card.



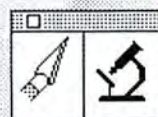
SILICON BEACH
SOFTWARE

SUPERCARD™

The personal software toolkit

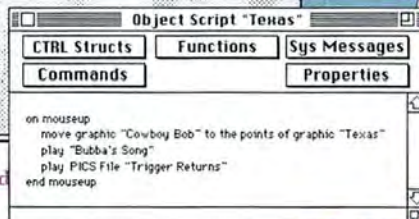
System Requirements: Macintosh Plus, SE, SE/30, Macintosh II, IIx or IIcx. RAM required: 700K for b&w, 1500K for color. Hard drive recommended. SuperCard and the Silicon Beach Software logo are trademarks of Silicon Beach Software, Inc. HyperCard is a registered trademark of Apple Computer, Inc. Silicon Beach Software, Inc. 9770 Carroll Center Road, Suite J, San Diego, CA 92126 (619) 695-6956.

NOW SHIPPING!
Available through your local dealer.



Pro

R
RESOURCE



Options

Clear Order Forms

Update Sales Report

Show Client ☞K



Word 4.0 and PostScript

Word 4.0's powerful new features — table generation, WYSIWYG display of columns, text wrap around graphics — really position it as a low-end DTP product. But it still can't do some simple, but vital, desktop-publishing chores. Crop marks, for example.

Fortunately, Microsoft has provided a workaround. You could access some of PostScript's amazing capabilities in Word 3.02. The latest incarnation, version 4.0, extends this ability with predefined PostScript variables, group commands, and a glossary containing several common PostScript procedures (crop marks, gutter rules, column screens, and so on). This largess beckons users to experiment, yet most features remain tantalizingly obscured by paltry documentation. The commands work only for LaserWriters, but if you use one, grab a pencil. What Word has left unsaid shall now be spoken.

Group Commands

Placing bits of PostScript code (or even lengthy routines) into a Word document is simple. But Word requires that you first clearly define what part of the page will be affected by the PostScript code. Is it going to affect the entire page (for example, a box enclosing the page) or just a paragraph or inserted graphic?

You define the boundaries by inserting a *group command* immediately before the page element it will affect. In Word 3.02, you could use three such commands: `.page.`, `.para.`, or `.pic.` (referring to the entire page, the next paragraph, or the next graphic insertion). Version 4.0 has added `.cell.` and `.row.` to facilitate PostScript manipulation of tabular material, and `.dict.`, which we'll discuss later.

Group commands create a *drawing rectangle* that specifies the overall size of the PostScript graphic. The actual dimensions of the graphic never have to be entered, because the command gathers this information from Word itself. The drawing rectangle created by `.page.`, for example, is determined by the page size you've specified with the Page Setup command. If your page is 5 x 7 inches, the

drawing rectangle mirrors those measurements exactly. Most other group commands, such as `.para.` and `.pic.`, let you focus on increasingly smaller or more precise areas of the page — a paragraph, or a graphic frame within a paragraph.

After the group command is entered, you can enter PostScript code you've written or copied from another source. Here's a simple example that places a 5-x-7-inch box on a page. At the top of the page, type the following:

```
.page.
newpath
.25 setlinewidth
126 144 moveto
360 0 rlineto
0 504 rlineto
-360 0 rlineto
closepath
stroke
```

Anyone with PostScript savvy will notice some peculiarities here. The primary one is that the PostScript inclusion hasn't been bracketed by a `save/restore` or `gsave/grestore` pair, which prevents certain PostScript operators (rotate, for example) from changing the graphics environment of the entire page. Why this apparent breach of PostScript etiquette? Because the group commands automatically bracket each grouping of PostScript code with a `save/restorecouplet`.

You might also notice that the origin point (0 0) in Word's version of the PostScript coordinate system corresponds exactly to that found in PostScript itself. This means that the origin point (0 0) is found at the lower left corner of the current drawing rectangle, whether it is a page, paragraph, or graphic frame.

Word's built-in PostScript routines and variables can go a long way to increasing the program's value as a tool for desktop publishing. The ability to create crop marks, for example, or to screen alternating rows in a form or table can greatly enhance the usefulness or appearance of your work.

```
% puts crop marks at page's four corners
/markl 9 def % length of crop mark
/whitel 4 def % white space inside crop mark
.5 setlinewidth % thin lines
% horizontals
wpsleft markl sub whitel sub wps$y wps$top sub moveto markl 0 rlineto
wps$y wps$right sub wps$left sub whitel 2 mul add 0 rmoveo markl 0 rlineto
wps$left markl sub whitel sub wps$bottom moveto markl 0 rlineto
wps$y wps$right sub wps$left sub whitel 2 mul add 0 rmoveo markl 0 rlineto
% verticals
wps$left wps$bottom markl sub whitel sub moveto 0 markl rlineto
0 wps$y wps$top sub wps$bottom sub whitel 2 mul add 0 rmoveo 0 markl rlineto
wps$y wps$right sub wps$bottom markl sub whitel sub moveto 0 markl rlineto
0 wps$y wps$top sub wps$bottom sub whitel 2 mul add 0 rmoveo 0 markl rlineto
stroke
```

```
.para. 9 setgray wps$box fill
```

A simple gray screen placed behind a paragraph can make it stand out and catch the reader's attention. And for the PostScript effects included with Word, you don't have to know even one PostScript command. You only need to know how to insert PostScript into Word.

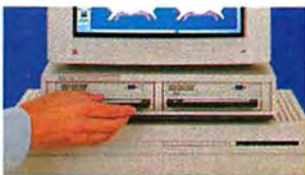
Figure 1: Word contains predefined PostScript commands that enhance its use as a DTP tool. Here, the commands for crop marks (from the supplied PostScript Glossary) and a gray screen are interspersed with plain text. The effects of this code never appear on-screen — only on paper.

THE NEW 44MB BERNOULLI TRIUMPHS OVER TIME AND SPACE.



The new 44MB Bernoulli™ sets new standards in performance and capacity for Macintosh® power users—users who want the growth and flexibility of removable storage. Because now Bernoulli offers 22ms effective access time and unlimited storage growth, 44 megabytes at a time.

But performance and capacity are just the beginning. Bernoulli reliability is second to none. Bernoulli's unique design resists head crash, a fundamental problem of conventional hard disks. Bernoulli Disks™ can also withstand over 1000 Gs of shock. In fact, they're the only removable disks that can take a fall from a desktop without data



loss. And Bernoulli Disks and Drives provide product life equal to or better than conventional alternatives.

Backup is easy and fast. Bernoulli lets you make disk-to-disk copies in as little as 3 minutes for 44 megabytes. And since Bernoulli Disks are removable, you can organize your projects on individual disks and keep all of them under lock and key. Now your data can really go places, too. Bernoulli lets you share files between your Mac and PS/2®s, PCs and compatible computers,* and with Bernoulli's ruggedness you can send disks across the office or around the world with-

out concern. And whether for growth or sharing, the 44MB Bernoulli lets you add additional storage for under \$3 per megabyte.**

Those are a few reasons why Bernoulli is the overwhelming leader in removable mass storage, with over 400,000 drive systems and 2.75 million disks in use worldwide. More important, 95% of those users recommend Bernoulli. So see your nearest Bernoulli Authorized Reseller, or call 800-453-3304 for complete benefits and specifications.

OMEGA
Never ending storage solutions.

*Made possible with Omega's Bernoulli File Exchange software. **Based on \$125 U.S. retail price per 44MB disk. Bernoulli and Bernoulli Disk are trademarks of Omega. Macintosh is a registered trademark of Apple Computer, Inc. PS/2 is a trademark of IBM.

Please circle 3 on reader service card.

Printing PostScript

If you print the document now, you won't magically have a PostScript-generated box on the page. The code prints as ordinary text. To have it executed, you must do several things. First, select the PostScript code (including any group command). Then hold down the Shift key and pull down the Format menu. You'll see that Styles has been replaced by the All Styles command. All Styles has several predefined styles, including one called PostScript. Select it and click on OK. The PostScript code has now been changed into a form that will be interpreted rather than printed (see Figure 1). To see the code after this point, make sure that Show Hidden Text is selected in the Preferences dialog box (Edit menu).

You can't see the results of your tinkering by using the Print Preview command; you must print the document on a LaserWriter (see Figure 2). When you print, make sure that Print Hidden Text isn't selected in the Print dialog box and check the Chooser to make certain that Background Printing is turned off. If Background Printing is left on, the PostScript effects will be shifted down and to the right from where you want them on the first page of the document. Subsequent pages will print correctly.

The on-screen appearance of Word's native PostScript style leaves something to be desired. Fortunately, you can easily modify most of the attributes. While holding down the Shift key, select Define All Styles from the Format menu. Select PostScript. The description box defines the style as "Normal + Font: 10 point, Bold Hidden." The main culprit here is Bold, which makes the type hard to read. So just pull down the Format menu while the dialog box is showing and turn off Bold. You can safely change anything in the PostScript style other than the Hidden attribute.

Screens and Crop Marks

So far, the process is simple enough. But what if you want to place, say, a gray screen behind a single paragraph. Do you need to know the precise location and size of the paragraph? Not at all. First, remember that the group command `.para.` creates a drawing rectangle that

Word's built-in PostScript routines and variables can go a long way to increasing the program's value as a tool for desktop publishing. The ability to create crop marks, for example, or to screen alternating rows in a form or table can greatly enhance the usefulness or appearance of your work.

A simple gray screen placed behind a paragraph can make it stand out and catch the reader's attention. And for the PostScript effects included with Word, you don't have to know even one PostScript command. You only need to know how to insert PostScript into Word.

Figure 2: When a Word document with embedded PostScript is printed, the magic and power of PostScript become clear. This LaserWriter output shows how PostScript-created crop marks and a gray screen can enhance the usefulness and appearance of a page.

Word 4.0 comes with its own PostScript glossary of predefined procedures.

corresponds to the size and position of the paragraph it precedes. And Word has another card up its sleeve — built-in PostScript variables. There are 22 variables, which will aid you as you develop code. For a list of the variables and their descriptions, see pages 285 and 286 of the *User's Guide*.

To make a screened paragraph, we need the variable called `wp$box`. Here's what you need to type in front of the paragraph (and then format in Word's PostScript style as described before):

```
.para.  
.9 setgray wp$box fill
```

By the way, you don't have to use carriage returns, although they make the code more legible. You could simply type:

```
.para. .9 setgray wp$box fill
```

In any case, the variable `wp$box` is equivalent to defining a drawing rectangle the same size as the paragraph. Without it,

you'd have to determine the coordinates of the paragraph (with a ruler on a print-out) and type something like

```
126 144 moveto  
360 0 rlineto  
0 504 rlineto  
-360 0 rlineto  
closepath  
fill
```

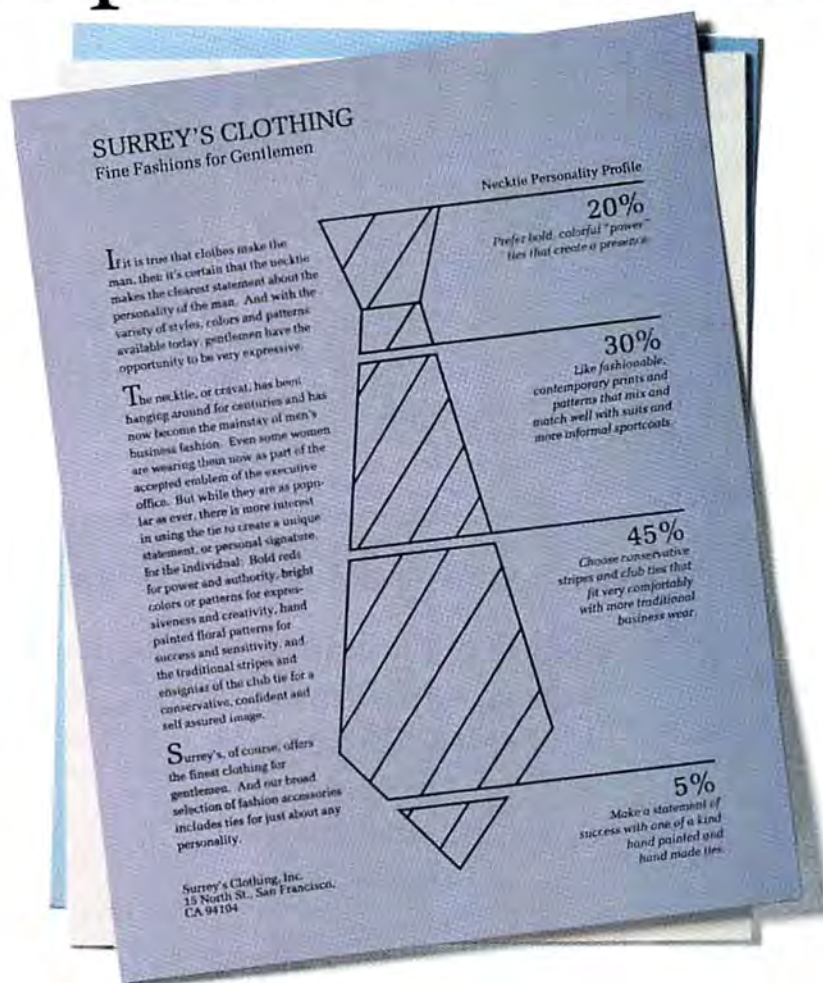
These are hypothetical coordinates, but you can see the advantages of having the variables. You save a lot of typing, and you don't need to figure out specific positions or dimensions.

An even clearer example is crop marks, one of six routines included in the PostScript Glossary that accompanies Word 4.0. After the actual crop marks are defined, the routine places them at the corners of the page. Ordinarily, you would have to know or calculate exact positions for the marks, a painstakingly bothersome task. But with judicious use of some of Word's variables, you can avoid the hassle:

```
wp$left mark1 sub wht1 sub  
wp$y wp$top sub moveto mark1 0  
rlineto  
stroke
```

The variables `wp$left`, `wp$y`, and `wp$top` refer to the left margin, the drawing rectangle's height, and the top margin respectively. You don't need to

What's the best way to dress up your printed documents?



Pro-Tech Computer Paper and Film

There's no better way to brighten your brochures, rev up your reports, or add a little sparkle to your in-house newsletters, handbooks, invitations, and overhead presentations.

Pro-Tech Computer Paper and Transparency Film is available for laser, impact, ink jet and thermal transfer printers, as well as pen plotters. In a wide range of colors and special finishes. So now you and your business documents can dress for success.



Pro-Tech

Because the right paper and film makes all the difference.™

Send for free samples. If you'd like a sample of the right paper for your printer, and information on how to dress up your printed documents, simply fill out this coupon and mail it to: Pro-Tech, James River Corporation, Electronic Imaging Products, 1500 Forest Ave. (#208) Richmond, VA 23288. Or call us toll-free Mon. - Fri. 9:00 - 5:00 EST at:

1-800-521-5035.

Name _____ Title _____

Company _____ Telephone _____

Address _____

City _____ State _____ Zip _____

My Computer Printer is _____

(Manufacturer - Make - Model No.)



JAMES RIVER CORPORATION
ELECTRONIC IMAGING PRODUCTS

© 1988 James River Corporation

MCU 9/89

Please circle 59 on reader service card.

get the dimensions from the Page Setup dialog box. Word fills in the appropriate numbers when the file is interpreted and sent to the printer. And if you change the page size, you don't have to go back to the code and insert new dimensions.

Creating Global Commands

When PostScript requires specific measures or positions that can't be referred to through the built-in variables, the dimensions are expressed in points. If you feel more comfortable working in inches, simply place the following code after a group command such as `.para.` or `.page.` (and, of course, format it in Word's PostScript Style):

```
/inch {72 mul} def
```

Then you can use code such as `1 inch 1 inch moveto` instead of `72 72 moveto`. The routine you've inserted automatically multiplies the inch units by 72, converting them into PostScript's point system.

Ordinarily, such a routine applies only to the drawing rectangle indicated by the group command. So if you had a `.page.` and several `.para.` PostScript groups on the same page, you would have to insert `/inch {72 mul} def` in each group. When Word scans the page for PostScript, it does each group in turn and discards the variables or routines of that group as soon as it has been processed. Even routines or variables placed after the `.page.` command can't be used by other groups on the same page.

In Word 3.02, this made it difficult to create routines that would remain in effect throughout a document. You could add PostScript operators such as the inch conversion to Word 3.02 by using ResEdit to modify the Serial Printer driver

(available from Microsoft). This process is fully described beginning on page 554 of *Working with Word* by Chris Kinata and Gordon McComb (Microsoft Press, 1988). Version 4.0's new `.dict.` group command — along with a sly trick — makes this somewhat delicate procedure unnecessary.

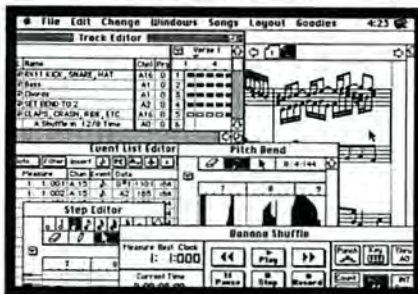
A `.dict.` group contains procedures, user-defined variables, and other definitions that you want to use in more than one group on a single page (such as the inches-to-points conversion). Note that these procedures are still valid only for one page. Does that mean you have to insert the `.dict.` group at the start of every page? Absolutely not. Make Word do it for you by placing the `.dict.` group into the header of the document. Happily, Word always scans the header before any other part of the page for PostScript codes. A `.dict.` group placed there is, in effect, operative until the end of the document.

This same trick can be used to perform actual drawing routines. You can, for instance, write a program that prints the word DRAFT across the page in gray type (see Tip Sheet, July '89) or that causes the page to be boxed (as in our first example). By placing this routine in the header, you can ensure that the graphic will be drawn on every page.

Even if you plan never to write your own PostScript code for use with Word, you'll find working strictly with the six PostScript Glossary items can be rewarding. And if you do generate PostScript code, take a hint from Microsoft and use the Glossary to store commonly used bits of code, entire procedures, and `.dict.` collections. □

— Gregory Wasson

Macintosh Music



PRO 4™ is Passport's new professional MIDI sequencer, designed to give you innovative and advanced tools in an easy to use package. It provides a track editor for recording and playback, graphic faders, a song playback list, note pad, song editor, graphic and list editors. Edit multiple sequences, perform most operations in real-time during playback, view your music in a variety of ways and lock everything to SMPTE.

Encore™ is a powerful MIDI composing environment that lets you create and perform music in standard music notation. Enter music in real-time or step-time using a MIDI keyboard or mouse, and perform your composition on any MIDI gear. Encore intelligently transcribes and prints out Master Tracks Pro™ and Pro 4™ sequences, reads and writes standard MIDI files, and can print entire scores or single parts using the Sonata™ music font.

NoteWriter II™ is a flexible and precise page layout program for music publishing. Engrave music as complex as you like with great ease! It provides a complete arsenal of music symbols, plus tools to design custom symbols. NoteWriter II is compatible with PageMaker™ and other page layout systems and can print multiple page documents using the Sonata music font.

Pro 4, Encore and NoteWriter II are Multifinder™ compatible!

Call (415) 726-0280 today to receive information on our complete line of Macintosh Music Products.

PASSPORT®
625 Miramontes St.
Half Moon Bay, Ca. 94019



Please circle 58 on reader service card.

Smear Campaign

Figure 3: Politicians might find this special PostScript effect useful. It's called "smear word" and is included in Word's PostScript Glossary.

Hub. Hubba Hubba.



Typical Macintosh Network Hub



The TurboStar Macintosh Network Hub

Now there's a second generation active hub that actually gives you something to get excited about.

Nuvotech TurboStar.™ The only automatic AppleTalk hub.

It has a Motorola 68008 32-bit processor. So it can handle 16 ports. If a problem develops, TurboStar disconnects the bad node automatically. Which makes network crashes a thing of the past. TurboStar even reconnects nodes automatically. And reconfigures itself after a power outage.

TurboStar can be configured from any Mac on the internetwork. So there's no management bus needed. We even include diagnostic software that tells you what devices are active on each port, how busy they are, and what your network's load factor is.

But with all this sophistication, TurboStar operates on standard twisted pair wire. And the whole package, complete with diagnostic software, is only \$1795.

If you'd like to know more, call (800) 232-9922, or in California (415) 331-7815. We'll send you full information. And show you what all the hubbub is about.

TurboStar is a registered trademark of Nuvotech.
Any other product names are registered trademarks
of their respective owners.

Please circle 102 on reader service card.

Nuvotech

BRIDGES

"Divide and conquer" works in battle, and it also applies to networks. One of the easiest ways to unclog network bottlenecks is to divide your network into subnetworks with a router. Kee Nethery's review of five LocalTalk-to-LocalTalk routers tells you when routing helps and when it hurts. If you've been reading the hints and tips in Kurt VanderSluis' Trouble Shots, you know that he's no fan of passive-star networks; active stars are the first step toward a truly cosmic network experience.

WRITE TO

Bridges, c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

EDITED BY HENRY BORTMAN

LocalTalk on the Ceiling

Do you, like many of us, have a dynamic office environment — lots of cubicles constantly being rearranged and people moving from one cube to another? Does your network wiring give you headaches every time you reorganize? You might want to consider putting it on the ceiling. With light beams.

Photolink, from Photonics, uses infrared light bounced off a wall or ceiling in

the FDHD), which is standard on the Macintosh IIx, IICx, and SE/30, can read DOS-formatted 3.5-inch disks, but it cannot display their contents in iconic form on the desktop. The only tool Apple provides for seeing the contents of a DOS disk or for transferring files between DOS and Macintosh disks is the Apple File Exchange utility — not my favorite piece of software.

Dayna has now made the technology behind the DaynaFile available to those of us who can't justify the \$600 expense of a DaynaFile. DOS Mounter, an \$89.95



ILLUSTRATION: K. DANIEL CLARK

place of wires to make LocalTalk (230.4 kilobit/second) connections among Macs. Users won't notice any difference; no INIT or other special software is required. Each Photolink transceiver, which mounts on a bookcase or on top of a partition, has four ports. You can attach a single Mac or a daisy chain of several devices to each port. When two or more transceivers aim their infrared beams at the same point on the ceiling, they effectively create a passive-star network (don't tell Kurt VanderSluis). Each transceiver costs \$995.

Photonics Corp.
200 E. Hacienda Ave.
Campbell, CA 95008
(408) 370-3033

DOS on the Desktop

Until recently, if you wanted your DOS disks to appear on the Mac desktop, you needed an external drive such as the DaynaFile. Apple's SuperDrive (a.k.a.

INIT, goes into your System file. When you place a DOS-formatted 3.5-inch disk in your SuperDrive — sorry, it doesn't work with 800K drives — it appears on your desktop as a disk icon. You can copy files between the DOS disk and Mac floppies or hard disks, create folders — the works — by clicking and dragging. It's the way a Mac *should* work with DOS disks, and it's very nice of Dayna to have made the technology available.

DOS Mounter supports extension mapping. DOS filenames have two parts, the name and the extension, separated by a dot. With extension mapping, you can tell the Mac to use, say, a WordPerfect icon to display any DOS file that has a .doc extension — myfile.doc, for example. You can use the Control Panel to store extension maps.

There are a couple of drawbacks, however. The first is that DOS Mounter is slow. If you're used to hard-disk response times and find working with Mac floppies tedious, wait till you try a DOS

408-983-1127

Call this number for a 30 day trial on

**The Best Priced
The Most Reliable
The Smallest**

**80MB
\$999**



Put a couple of dollars together
to size the Liberty drives.
Size 2"x5"x7", Wt. 3 lbs.

**MacUSER
LABS**

"The Liberty 80 is the most compact (drive) and comes with some nice software"

MacUser

"Having used Liberty 80 megabyte hard disk drive for the last five months, I have to say that it is everything I had hoped it would be: compact, lightweight, quiet, fast, and durable enough to ride with me in my briefcase to all my road show demonstrations and talks. You can add me to your list of satisfied customers."

DANNY GOODMAN

Author: The Complete HYPERCARD Handbook

40MB (Quantum)	12ms	\$749
80MB (Quantum)	12ms	\$999
100MB (Conner)	25ms	\$1099
105MB (Quantum)	12ms	\$1299
90-250 volt option		\$ 50
Carrying cases		\$29
Password-Volume Partitioning		
Quantum ProDrive Series		

"employ(s) the lightning-fast Quantum ProDrive80, now considered one of the most reliable and nimble hard-disk-drive mechanisms for the Macintosh."

MacUserLabs

Liberty
Systems

120 Saratoga Ave. Suite 82,
Santa Clara, California 95051

MASTERCARD VISA

Please circle 76 on reader service card.

Another Complete Ready-to-Run Macintosh System from CDA

Macintosh IIfx Color System

Complete system includes:

- Macintosh IIfx Computer w/
40 Megabyte Hard Drive
1 Megabyte of Memory
Extended Keyboard & Mouse
1.44 Meg Disk Drive
- Macintosh II Video Card
- Apple RGB Hi-Res. Analog Monitor
- ImageWriter II Printer w /cable
- HyperCard Software
- Dust Covers for Complete System
- Package of Computer Paper
- Box of 10 Diskettes & Mouse Pad

Package #X8950 (delivery 152.00)

Sugg. list \$7606
CDA Price \$5795
Save Over \$1800

Lease for only \$159/month*

*For Qualified Businesses, Based on a
48 Month FMV Lease



Shipping Information & Policies

Delivery charge includes shipping, handling & insurance for **DHL Door to Door Express Service** to the continental US, Alaska, Hawaii & PR. DHL to Canada add \$20 to delivery charge. DHL worldwide call or fax for rates.

DHL Major Credit Cards Accepted.

CDA is not an authorized Apple dealer. Apple, Macintosh, HyperCard & ImageWriter are registered trademarks of Apple Computer Inc. All prices subject to change.

CDA Computer Sales, 1 CDA Plaza
PO Box 533 Califon, NJ 07830
Outside US/in NJ 201-832-9004



Fax# (201) 832-9740
Mon-Fri 9am-10pm, Sat. 9am-5pm EST
Customer Service (201) 832-9007
Compuserve's Electronic Mall-GO CDA

US/Canada Call Toll Free
800-526-5313



CDA
computer sales
Mailorder Exclusively Since 1980

Call or write for our free Macintosh Users' Catalog featuring a full line of Apple Macintosh systems, hardware, software, accessories and more.

Ad #36-09

Please circle 116 on reader service card.

disk. It's coffee-break time just to copy a small file.

The second problem is even worse. The product is copy-protected — and, to top it off, it's copy-protected in a particularly ugly way. You must insert the *original* master disk into your Macintosh and *modify it* in order to run DOS Mounter. This is absolutely unacceptable. I *never* put an unlocked master disk into my Macintosh, much less write to it. Haven't these folks heard? Copy protection is out. And haven't they heard about viruses? Dayna, you've got a great product. Drop the copy protection!

Dayna Communications
50 S. Main St., Fifth Floor
Salt Lake City, UT 84144
(801) 531-0600

VMS: Phase 2 On Hold

There's a big hole in AppleTalk Phase 2. AppleTalk for VMS 3.0, required for Phase 2 compliance, was not announced along with the other pieces of Phase 2. Apple will say only that this announcement "will be made jointly with Digital" — but it won't say when. The result: delays and headaches for network managers who want to migrate large VMS-based EtherTalk networks from Phase 1 to Phase 2.


Stay tuned.

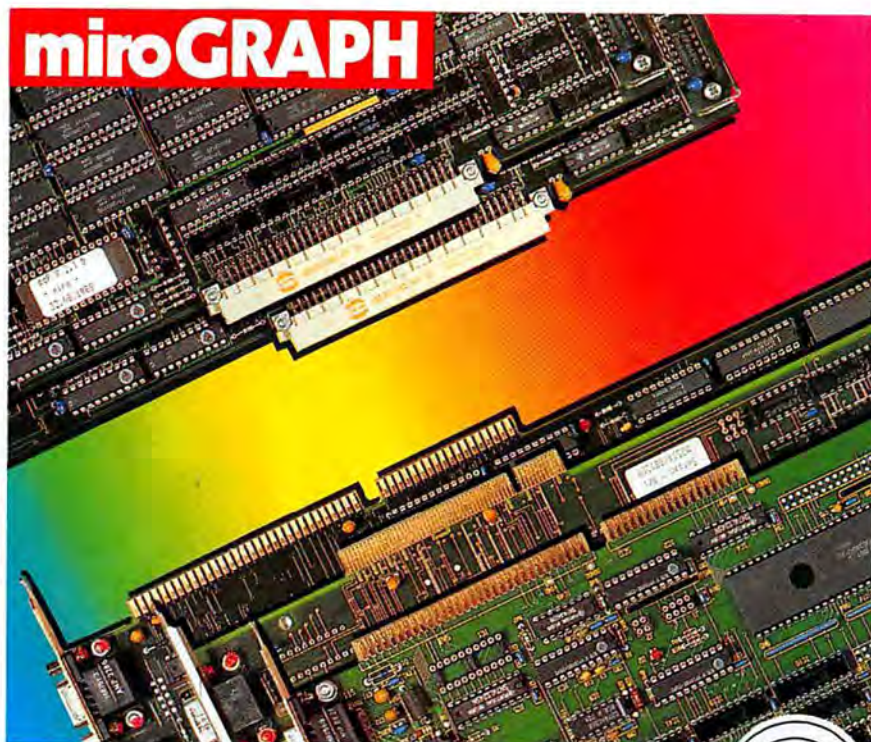
LAT on the Mac

At the Spring Developers' Conference, Apple announced the details of the Communications Toolbox, which will be part of System 7.0 software. This Toolbox will provide underlying technology for data-communications connections, terminal emulation, and file transfer between Macintoshes and other operating systems. By providing this core technology — which has long been missing from Macintosh system software — Apple will allow application vendors to concentrate on the more-interesting aspects of communications software and will help standardize the user interface for communications tasks.

A particularly exciting part of the Toolbox announcement was the revelation that, as part of the Apple/Digital

Equipment (DEC) agreement, Apple has licensed LAT technology from DEC. LAT is a very efficient high-performance transport mechanism for DEC terminals. Non-LAT terminal sessions to a VAX host interrupt the host processor every

time a key is pressed at the terminal. LAT buffers the data going to the host, reducing the strain on its CPU. In addition, LAT will enable Macintoshes to run multiple terminal sessions to multiple VAX hosts simultaneously. 



**GRAPHICS FOR
MAC II**

**AND
IBM**

Flickerfree Display
72 dpi and 75 Hz refresh rate are the common features of these boards. You can choose: 256 colors, 256 greyscales or black and white. Compatible with any software based on the Apple Color Quick Draw.

Highest Resolutions
microGRAPH graphics boards for PC/ AT and PS/2 are featuring resolutions of 1024 x 768, 1280 x 1024 or 1600 x 1200. Drivers for major software products are supplied with our boards. Ask for our actual compatibility list.

Made in
Germany



USA: miro, 27758 Santa Margarita Pkwy., Suite 285, Mission Viejo, Ca 92691, Phone 1-714-380-1120, Fax 1-714-5822873
Germany: miro, Gifhorner Str. 28, 3300 Braunschweig, Phone: 49-531-30091-0, Fax 49-531-30091-99, Apple Link GER.XSE0012

Please circle 89 on reader service card.

Network nitty- gritty.



PhoneNET is a registered trademark, and PhoneNET StarController, PhoneNET Repeater, PhoneNET CheckNET, and TrafficWatch are trademarks of Farallon Computing, Inc. Other brands are trademarks of their respective holders. © 1989 Farallon Computing

FULL SPEED AHEAD.

More Traffic on Your LocalTalk Network. No Traffic Jams.

A network should be like a high-speed freeway designed to handle heavy

traffic flow. But most LocalTalk® users know that it can be more like the rush hour crawl. Even if they've tried to improve things using flashy products with flashy names!

Put DaynaTALK™ on your network, and you'll go full speed ahead. Up to seven times the speed of standard LocalTalk, without long waiting lines on the on-ramp.

Characteristics	DaynaTALK	FlashTalk
Top speed for PC	1.7 Mbps	768 Kbps
Top speed for Macintosh	850 Kbps	768 Kbps
Maximum cable length*	1000'	400'
Collision Avoidance System	Yes	No
100% AppleTalk compatible	Yes	?
Power supply required	No	Yes
Required on all nodes	No	Yes

DaynaTALK
leaves the competition in the dust.

DaynaTALK lets you get information on and off the network faster, more reliably. That means more traffic, without the traffic jams.

Other products that try to do the same create more problems than they solve. They're all flash and glitter! But DaynaTALK's SpeedGuard™ Collision Avoidance System keeps high-speed traffic moving through the network error free. At speeds up to 850 Kbps Macintosh® to Macintosh and an amazing 1.7 Mbps PC to PC.

That's a new LocalTalk LAN speed record!

Improved network performance isn't somewhere down the road. It's here today. Full speed ahead at Dayna. Call us now at 801-531-0203 for the latest traffic report and where to buy DaynaTALK.



Dayna

50 South Main, Fifth Floor, Salt Lake City, Utah 84144

*Actual speeds on your network may vary depending on the quality and length of the network cable used. Dayna and the Dayna logo are registered trademarks, and DaynaTALK and SpeedGuard are trademarks of Dayna Communications, Inc. All other product names mentioned are trademarks or registered trademarks of their respective holders. © 1989 Dayna Communications, Inc.

Please circle 5 on reader service card.

A Guide to LocalTalk Routers

Reliability is the key to picking the right router. We tested the five LocalTalk-to-LocalTalk routers on the market; here are our picks.

By Kee Nethery

Imagine that you are one of 50 callers on a conference call. According to protocol, only one person talks at a time, no one monopolizes the call, and everyone waits until a pause in the conversation before saying anything. Now imagine a second conference call, not directly connected to the first. To speak with someone on the other conference call, you have to go through some kind of switching device that can bridge the gap between the two conference calls and forward messages between them.

AppleTalk works in much the same way. Each "conference call" is a network. Each person on the call is a node — a computer, a printer, or another network device. The AppleTalk protocols define the rules by which nodes communicate with each other. Data packets are the "conversation" on the line. And a bridge, or router, acts like a switch that connects two networks.

Strictly speaking, bridges and routers serve different functions. The distinction between the two, however, is a rather subtle one and is beyond the scope of this article. More important is the fact that, in AppleTalk networks, there are no "true" bridges. All the switching devices that are commonly called bridges are really routers.

An AppleTalk router straddles two networks; listens to both of them; and, if appropriate, forwards messages between them. A router does not forward mes-

sages if the conversation is just among nodes on the same network. Not forwarding messages unnecessarily is called traffic isolation, and it is the main function of an AppleTalk router. It reduces overall network traffic by restricting certain data packets to only part of the internet. (An internet is a meganetwork comprising two or more smaller subnetworks.)

A router cannot speed up your total network throughput — a LocalTalk-to-LocalTalk router, for example, cannot make a LocalTalk network transfer data faster than its specified rate of 230.4 kilobits per second — but by isolating traffic within small subnetworks, routers can reduce the traffic in each subnet. That speeds up the effective performance of

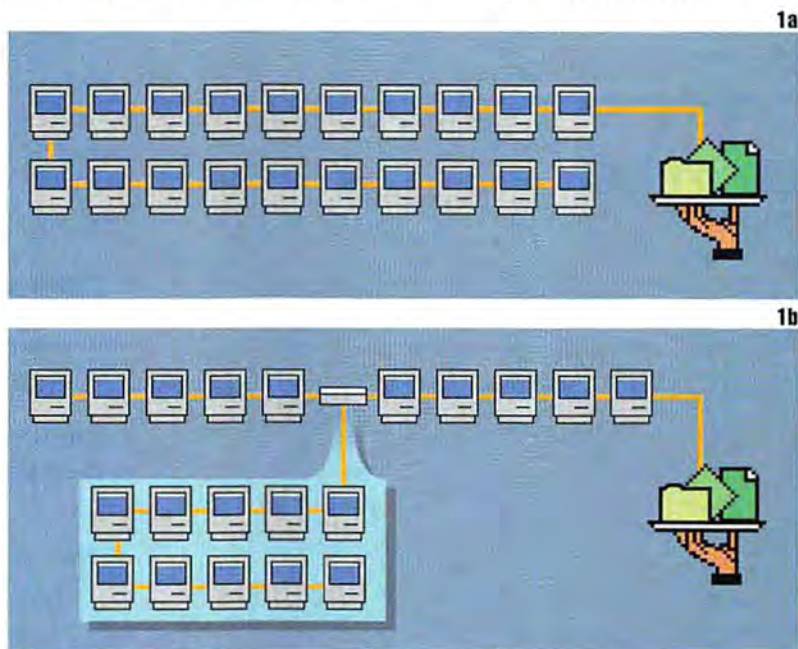
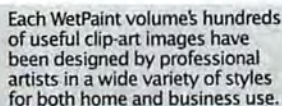
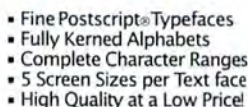


Figure 1: When Not to Use a Router.

In Figure 1a, 20 nodes share access to a server, so each node gets (roughly) three minutes of access per hour. In Figure 1b, adding a router improves server access to about six minutes per hour for the ten users on the same network as the router but reduces it to only about 30 seconds per hour for those on the other network.

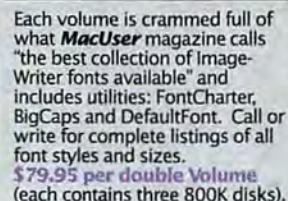


Read
WetPaint files using your paint
program, or our **ArtRoundup**
desk accessory—**Free** with every
volume! ArtRoundup's slideshow
tool makes it easy to scan tons of
images in just minutes.
\$79.95 per double Volume
(each contains three 800K disks).



Each set of two 800K disks includes: BigCaps, Default-Font, FontCharter, Font/DA Mover, LW Download, and the Utility City font for just **\$79.95**

IN ALL Utility City (in every set)
 99 12345/67890



**Call or write for
our free catalog:**
(818) 700-9525 Pacific Std. Time

Dubl-Click Software ♦ 9316 Deering Avenue ♦ Chatsworth, CA 91311

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Conference + Exposition

September 20 - 23, 1989
Moscone Center, San Francisco

**The worldwide
"Event of the Year"
for publishers.**

Seybold is the largest and most important conference and trade show for desktop publishing, professional publishing and electronic prepress publishing technologies.

The Conference — September 20, 21 & 22.

The premier forum for discussing the future course of the publishing application.

The Exposition — September 21, 22, & 23.

The largest exhibition of electronic publishing systems ever held in the U. S. The show will feature 250 exhibitors, 200,000 square feet of floor space and dozens of new product introductions.

Whether you attend the Conference or just the Exposition, the 1989 Seybold event is a must for anyone with a serious interest in the use of computer technologies for publishing.

**Call or write for your copy
of the event brochure.**

Seybold Seminars

6922 Wildlife Road
P. O. Box 578
Malibu, CA 90265 USA
(213) 457-5850 FAX: 457-4704

NOW, MACLINKPLUS TRANSLATES EVERYTHING UNDER THE SUN

MACWORLD EXPO
BOOTH 5133 WTC



The award-winning software package that transfers and translates files between Macintosh and DOS or OS/2 programs now does the same for Sun worshippers. And for the NeXT world.

With MacLinkPlus/PC, you can now send files in either direction between Macintosh and virtually any other desktop environment. Files arrive in the new environment with the correct styles and formats in place—just as if they had been created there.

MacLinkPlus/Wang OIS and MacLinkPlus/Wang VS provide the same bi-directional connectivity between Macintosh and Wang.

TRANSFERS AND TRANSLATES

The MacLinkPlus/PC package arrives with everything you need—software, manual, a direct connect cable (a Hayes modem or compatible also works), and our full library of over 60 translators.

If you don't need file transfer capabilities (maybe your Macs and PCs already share a network or server), then simply order MacLinkPlus/Translators. It's the same package without the cable

and communications capabilities. And, it's the ideal software purchase for anyone with a Macintosh FDHD SuperDrive or external drive that reads DOS disks.

INSTANT PASSPORT TO EVERYWHERE

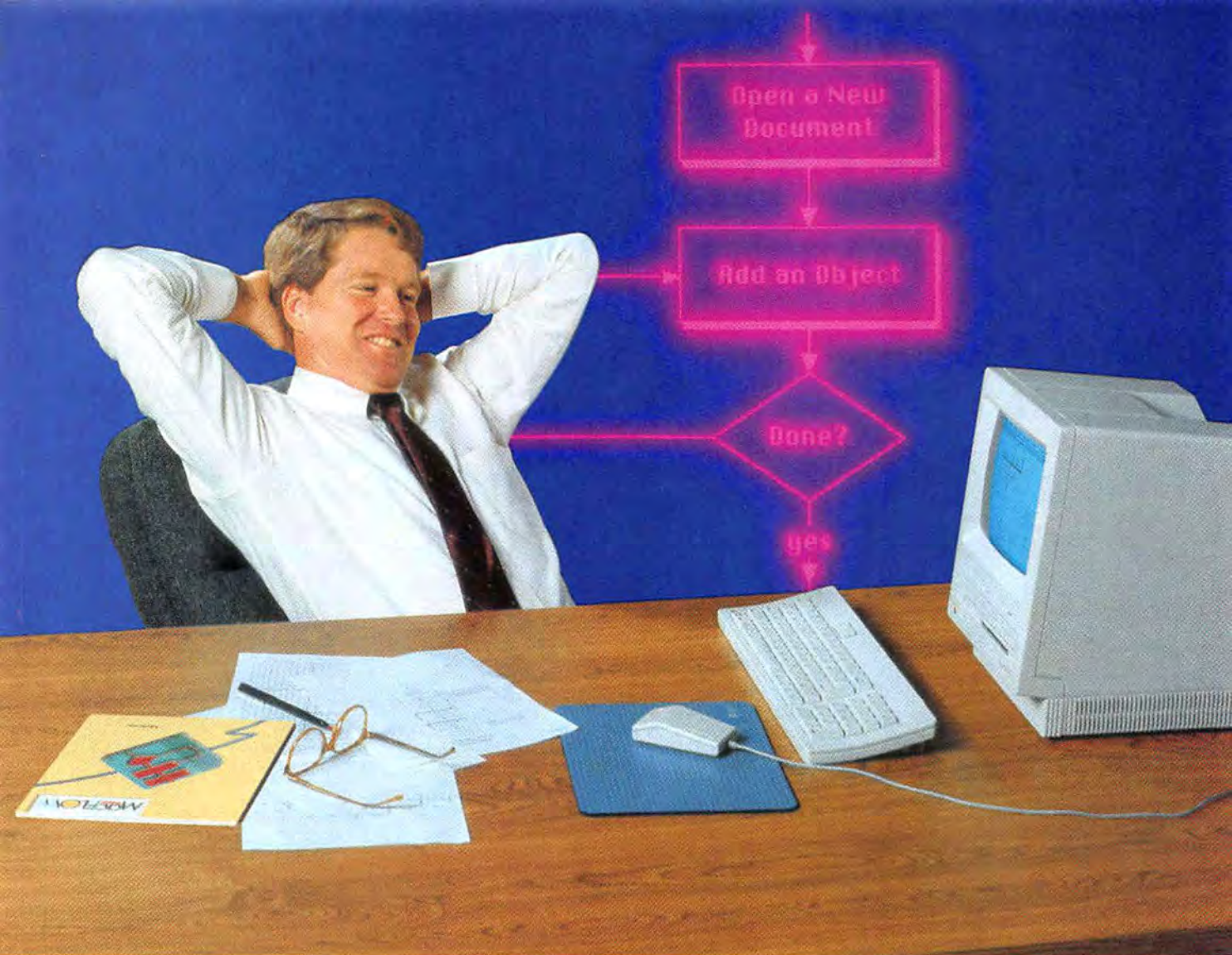
Make incompatibility a thing of the past with the MacLinkPlus family of Databridge products. For the name of your nearest DataViz dealer, call 203-268-0030 today.

All product names are trademarks of their manufacturers.



DATAVIZTM
THE DATABRIDGE SPECIALISTS

Please circle 189 on reader service card.



"My boss didn't understand, until I did a flowchart."

Introducing MacFlow 3.0

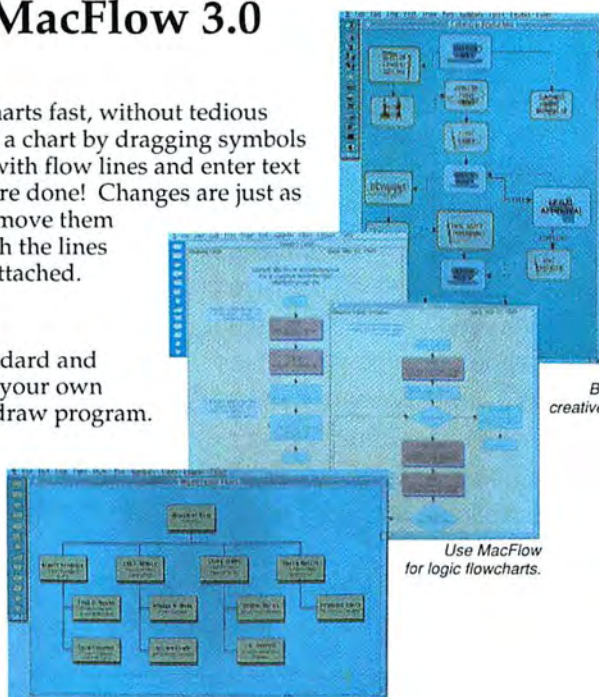
Fast, Clear Charts

Produce top quality flowcharts fast, without tedious drawing! Simply compose a chart by dragging symbols into place. Connect them with flow lines and enter text in symbols and lines. You're done! Changes are just as easy. Resize symbols and move them around; the text moves with the lines and the lines always stay attached.

Superior Graphics

MacFlow offers ANSI standard and custom symbols. Develop your own custom symbols with any draw program. Symbols print smoothly with no bitmap jagged edges. MacFlow supports full color and prints on color laser printers like the Tektronix™. It's great for quickly producing presentation quality charts.

Use MacFlow for organization charts.



Use MacFlow for logic flowcharts.

See the Big Picture...

MacFlow helps you develop an overall view of work, project or logic flow. Hierarchical organization links symbols to lower level flowcharts. Zoom to increased levels of detail and return to the big picture with a click of the mouse.

Make It Happen

State your case and make it happen. MacFlow is ideal for designing and documenting any kind of flow relations. Use it for project, operation and logic flow. Do software flowcharts, organization charts, troubleshooting diagrams and more.

Buy MacFlow today. See your dealer or contact Mainstay for further information.

Mainstay

5311-B Derry Avenue Agoura Hills, CA 91301 (818) 991-6540
71 rue des Atrebatés B-1040, Brussels, Belgium 322/733.97.91

Please circle 2 on reader service card.

the network by dividing it into parts. Each work group has less traffic and therefore fewer collisions — as long as users don't cross the bridge too often.

To Route or Not to Route

The most common mistake involving AppleTalk routers is installing them where they are unnecessary. Suppose you have a single network with 20 users and one file server (see Figure 1a). Let's say everyone is constantly trying to use the file server, so each node theoretically gets three minutes of access to the file server per hour.

You see an advertisement that says, "Speed up your network with an Acme SuperBridge!" You buy one and install the Acme router, which splits your network into two smaller subnets. You and half of the other users are now on a new network, on one side of the router. Everyone else and the server remain on the old network, on the other side of the router. Things should speed up significantly, you think to yourself, since each

on the new network, on your side of the router, must now share the router's six minutes per hour of server access time. Since you are one of the unfortunate ones who has to go through the router to get at the server, you now get access for only about 30 seconds — $\frac{1}{10}$ of six minutes — per hour. For you and for all the other users, your access to the file server has now been drastically reduced (see Figure 1b).

So when should you install a router? Install a router only if you have distinct work groups that do not regularly share network resources with users in another work group. *Network resources* include such things as file servers, mail servers, and printers. If slow printing is your main problem, the most cost-effective solution may be simply to add a print spooler to your network. If that doesn't do the trick, consider whether you can subdivide the users on your network into work groups — each work group will become its own subnetwork — and give each group its own file server, mail server, and printer. Then use routers to interconnect the work groups so that users on one network can send mail to, share files with, and print to a printer on another network.

But make sure not to put people on the "other side" of a router from a printer or server that they access regularly. (Remember the four-second-per-hour nightmare.) If most users can access their primary network services without communicating through a router, the routers are being used correctly, and everyone will have timely access to the resources they need.

Never put users on the "other side" of a router from a printer or server that they regularly access.

network is now handling only half the traffic.

Wrong. For those on the old network with the server, things do improve. Since there are now only ten nodes on that network, each node (one of which is the router) gets an average of six minutes of server access per hour, instead of the previous three minutes. They're the lucky ones. But as far as the server is concerned, the router is just another network node, one out of ten. The server doesn't know that there are ten more users sitting on the other side of the router. Everyone

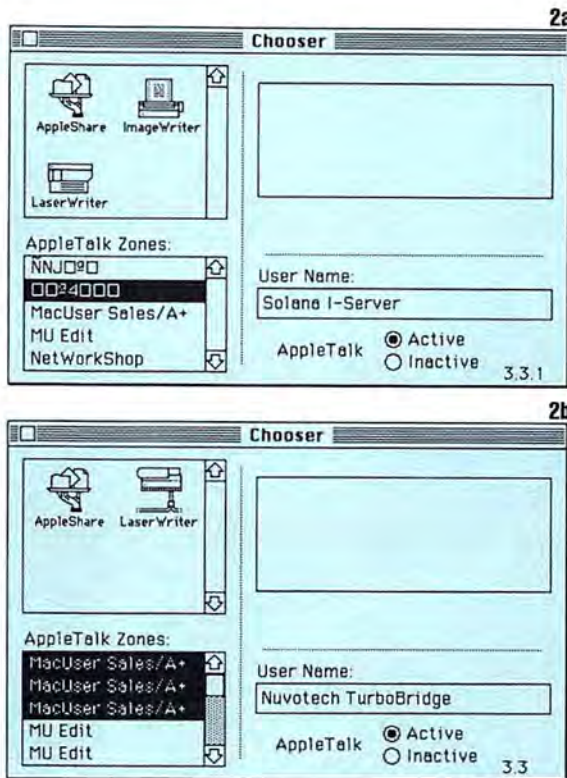


Figure 2: With Routers, Reliability Comes First. The Solana I-Server (2a) caused nonexistent zones to appear in the Chooser. The Nuvotech TurboBridge (2b) caused zones to appear three times each. We do not recommend using these routers until these problems are fixed.

Hardware and Software Options

Routers can connect many kinds of AppleTalk networks, including LocalTalk, Ethernet, Arcnet, broadband/video, and (probably by the time you read this) Token Ring. The kinds of networks you are connecting will determine what type of router you should use. For example, if your company has an existing Token Ring network and you want to connect a LocalTalk work group of Macs to it, you will need a LocalTalk-to-Token Ring router. This article covers only LocalTalk-to-LocalTalk routers.

A LocalTalk router can be implemented in either hardware or software. A hardware router is a specialized hardware box with the LocalTalk-router software built into its ROM. Updating a hardware router usually requires replacing the ROM chips, which your dealer or vendor may have to do for you. Software routers run on a Macintosh. In a way they are an extension of system software. This software

Legal

Letterhead

2nd Sheet

Labels

Executive

Envelopes

On Demand.

3 Bins

Automate three paper supplies. Letterhead, plain paper and a standard size envelope satisfy most office needs. Make your Apple, HP, QMS, Canon or other fine laser printer work harder so you get more done—several times more...

4 Bins

As the number of users of a laser printer rises, the number of paper types needed on demand also goes up. You may need four bins. Fits most popular laser printers. Holds up to 220 sheets per bin plus 50 envelopes.

6 Bins

Companies with complex operations need more ways to use laser printers. With automated supplies of paper and envelopes, the right choice is only a key-stroke away. When time is money, BDT's the answer.

For further information:
Outside Calif. 800/346-3238
Inside Calif. 714/660-1386
BDT Products, Inc., 17152
Armstrong Ave., Irvine, CA 92714



Get The Most From
Your Laser Printer

In Europe: Büro- und Datentechnik, GmbH, Saline 29, D-7210 Rottweil, W. Germany • Phone: 01149 741 2480 • Fax: 01149 741 248 224

Apple, HP, QMS and Canon are the respective trade names of Apple Computer, Inc., Hewlett Packard Company, QMS, Inc. and Canon USA, Inc.

Please circle 180 on reader service card.

can be quickly, easily, and inexpensively updated by use of a floppy disk. Although a software product can be quickly updated, hardware routers certainly have their advantages. The chances are slim, for instance, that someone will accidentally crash a hardware router—or take it home for the weekend.

For this article, we tested the five LocalTalk routers currently on the market: Hayes' InterBridge, Nuvotech's TurboBridge, Shiva's NetBridge, Solana's I-Server (all hardware), and version 2.0 of Infosphere's Liaison (a software router; version 1.0 was reviewed in the April '89 Bridges section).

Reliability

You wouldn't drive your car over a bridge that failed "only" once a week, and you shouldn't trust your company network to a router that fails only once a week either. Total reliability is more important than speed or cost. Failure or bad behavior from the device that con-

trols user access to precious network resources is simply not acceptable.

To test reliability, we configured all five LocalTalk routers and attached them to the *MacUser* network for several days. Of the five routers tested, the Solana I-Server (ROM version 1.050) and Nuvotech's TurboBridge (ROM version 33.15A) had obvious routing-table problems (see Figure 2). When we were using the TurboBridge, the Chooser showed each zone name three times. (Nuvotech is aware of this problem but couldn't say when it would be fixed.) The I-Server worked fine for a while but then added some garbage zone names to the zone list. Solana said that the I-Server likes to control zone names on a network and that when a Liaison user on the same internet tries to reset zone names that an I-Server has already established, the I-Server gets unhappy. A fix—which will entail a ROM replacement—should be available by the time you read this.

But until these problems are solved,

we do not recommend either of these products. Remember, with routers, reliability comes first.

The InterBridge (ROM version 1.12), NetBridge (ROM version 1.02), and Liaison (version 2.0) routers worked correctly, even when the others were providing incorrect information.

Message-Forwarding Speed

The primary function of a router is to isolate traffic, but it should also forward messages as quickly as possible. To test throughput, we compared the time required to copy a file from a node to a server on the same network with the time it took to copy the same file from the same node to the same server relocated to the other side of the router (see Figure 3). We ran both tests with two additional nodes generating a constant amount of background traffic. Because Liaison is a software router, you can choose between running it on a Mac dedicated to Liaison alone or as a background process. In

Take your office on the road for only \$295.

Stay in-touch wherever you go, with Liaison

Now, you can leave your office without leaving your office behind. Because Liaison is the software "bridge" that lets you take all your network resources—AppleShare, MacServe, or TOPS servers, E-mail, and LaserWriters—with you. Wherever you go. And, without requiring any special hardware.

Don't call us, we'll call you!

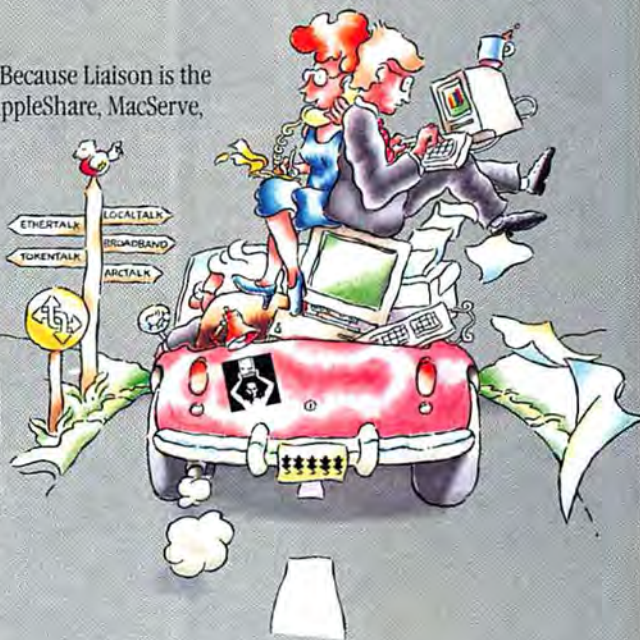
Sleep well knowing that Liaison will isolate your company's data from prying eyes and vengeful viruses. Liaison's seven layers of security—including dial-back from preauthorized phone numbers—allow only those you authorize onto your network.

Liaison extends the reach and security of AppleTalk:

- Access file and E-mail services from home or on the road with per-user authorization
- Connect company branch offices, across town or across the world
- Integrate LocalTalk, EtherTalk, TokenTalk, etc. into cohesive nets
- Make LaserWriters available to EtherTalk users
- Operates in the background.

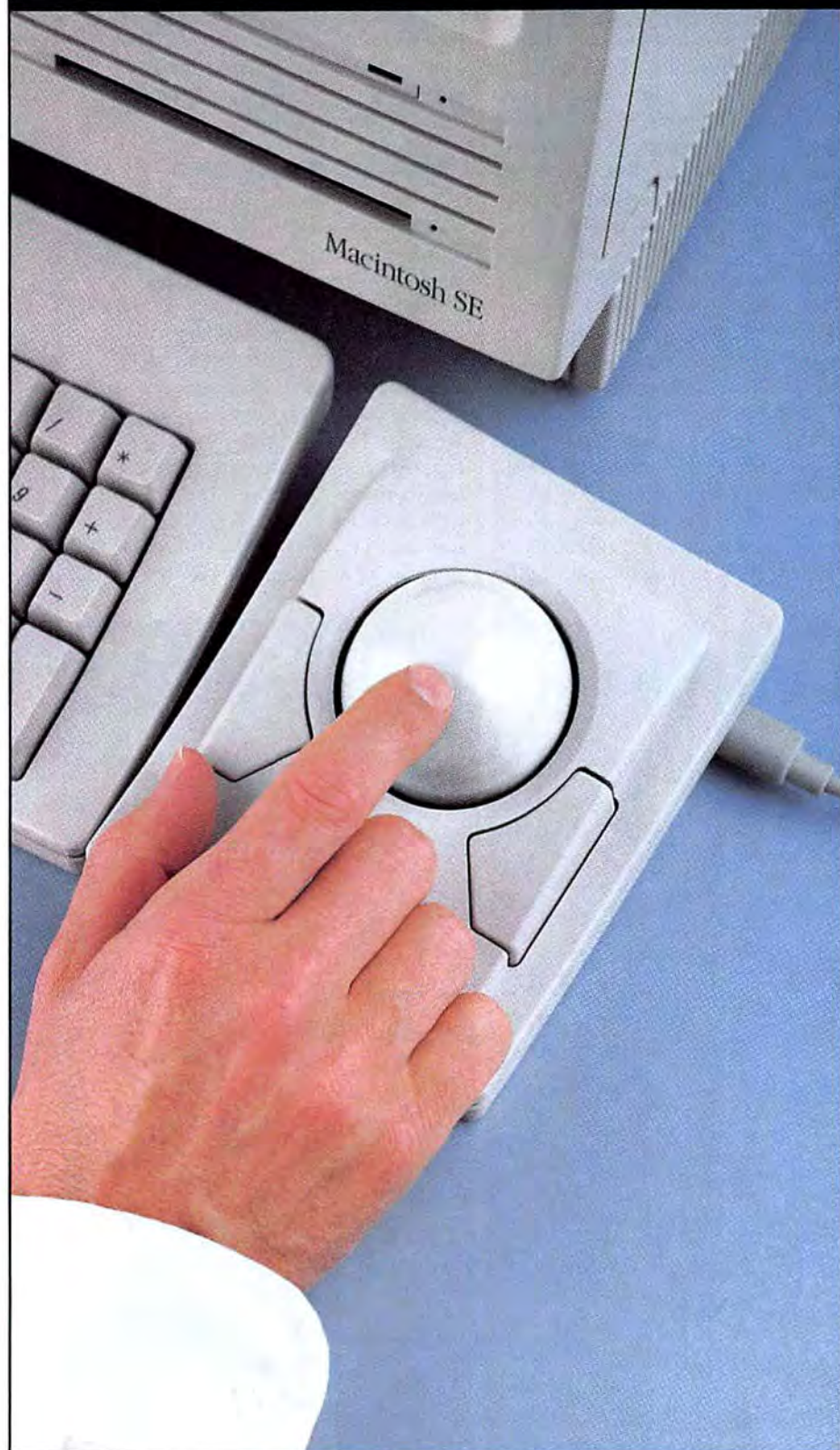
If you use AppleTalk you need Liaison. For information on how to order Liaison, call (800) 445-7085 today.

Infosphere, Inc. • 4730 SW Macadam Ave • Portland OR 97201
Please circle 111 on reader service card.



Liaison—recipient of the 1989 Eddy for Best New Networking Product and the only five mouse network product review. "Robust security... Works every time... A brilliant piece of programming... Look to Liaison first!" *MacUser*, April 1989

Kensington Turbo Mouse. For those who'd rather be quick and to the point.



Admit it. Aren't you tired of rolling your mouse around, running into papers or off the edge of the desk, knocking over coffee cups with its tail? Wouldn't you love an easier way to do things? We thought so. That's why we developed the Turbo Mouse®.

It takes half the space.

You move only the ball, not the whole mouse, so there's no rolling room required.

It's twice as fast. Fly across the biggest screen with automatic acceleration. It senses your working speed and moves the cursor further when you roll faster.

It's twice as smart. Its 200 CPI resolution is twice that of a mouse. It lets you use one button as a click, the other as a click lock. And with a Mac SE or Mac II, it will even perform one command when you press both buttons at once.

It's perfect for any Mac.

For Mac or Mac Plus, choose Turbo Mouse Plus. For Mac SE or Mac II, Turbo Mouse ADB. Both are \$169.95.

Call 800-535-4242 or 212-475-5200 for a dealer near you. Or write to us at Kensington, 251 Park Ave. South, New York, NY 10010.

KENSINGTON 

See us at MacWorld
World Trade Center
Booth #5344

Please circle 145 on reader service card.

background mode, you can run it behind a Mac acting as either a workstation or as an AppleShare server. We tested it in both stand-alone mode on a Mac Plus and running behind a Mac II workstation being used for heavy foreground word processing.

Liaison (running on a dedicated Mac Plus) and the TurboBridge were the fastest packet forwarders, adding a delay of only 35 percent to the local file-transfer time. Liaison running in the background on a Mac II and the NetBridge added a delay of 45 percent. (Liaison running on a dedicated II or '030 machine would be even faster.) The InterBridge added a delay of 75 percent, and the I-Server added a 100-percent delay. So of the three routers found to be reliable, Liaison was the fastest, followed by the NetBridge, which was the fastest hardware router.

Configuration Software

To do its job, a router must first be configured. When you configure a router,

you typically assign a zone name and network number for each of its LocalTalk ports. In some cases you can let the router assign its own names and numbers. The InterBridge, TurboBridge, NetBridge, and I-Server all come with stand-alone configuration applications. Liaison is configured from the Chooser. If you don't know what you're doing, router-configura-

tion software won't be as intuitive as a spreadsheet or a word processor. The manuals for all five of the routers we tested provide comprehensible instructions that lead you through the configuration process. Of these five manuals, Liaison's is the best.

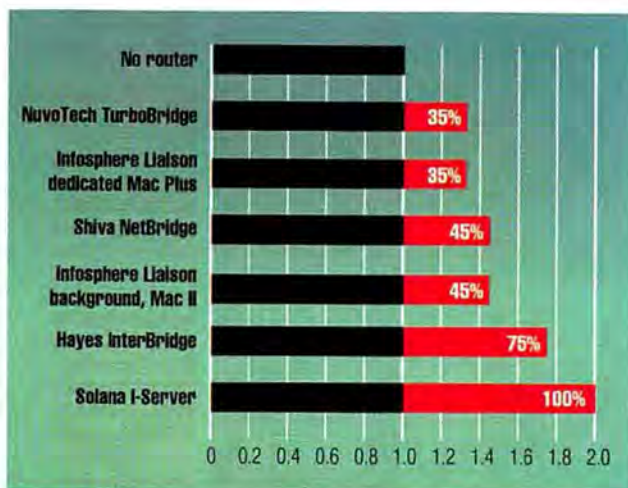


Figure 3: We first copied a file from a node to a server on a network with no routers. We then added a router, placed the server on the opposite side of it, and copied the file again. In each case, two additional nodes were generating constant background network traffic. The time to copy our test file with no router in the network is normalized to 1.0, shown in black. The percentage of additional time it took to copy the file with each router present is shown in red.

ILLUSTRATION: K. DANIEL CLARK

Coming Attractions



MAKING THE MIGRATION

By the time you read this, AppleTalk Phase 2 — an updated set of AppleTalk protocols that allows an AppleTalk network to contain more than 254 nodes — will be finding its way into corporate networks. Unless your Macintoshes are connected to a large corporate Ethernet or Token Ring internet, you don't need to worry about Phase 2 yet. But as Phase 1 is phased out, you will probably want to upgrade. All the vendors mentioned in this article will be coming out with Phase 2 upgrades to their products. Here are the details:

Hayes InterBridge

Hayes has announced InterBridge 2.0 (\$799), due out by the time you read this. Factory-installed upgrades for version 1.0 owners will be available for \$50 (or, for units purchased after June 12, 1989, free).

Infosphere Liaison

Infosphere is shipping a new version of Liaison (\$295) that supports both Phase 1 and Phase 2 networks and includes automatic tools for making the migration. Upgrades will be free to those who purchased Liaison within 90 days of the new version's initial shipping date; it will cost \$50 for those who bought the product earlier.

Nuovotech TurboBridge

Nuovotech will maintain two separate products for now, a Phase 1 router and a Phase 2 version. The Phase 2 router (\$499) and a

Phase-1-to-Phase-2 upgrade (which will require a ROM change for a "nominal charge") should be available by the time you read this.

Shiva NetBridge

A Phase 2-compatible NetBridge should also be available when you read this, for the same price (\$499) as the Phase 1 unit. Shiva will offer a single product that intelligently determines whether it should act as a Phase 1 or Phase 2 router. For \$100, current NetBridge owners can upgrade to Phase 2. The price includes new ROMs, software, and documentation.

Solana I-Server

Solana, like Shiva, plans to offer a single product (\$695) that can serve as either a Phase 1 or Phase 2 router. The new router and a "nominal charge" upgrade, which will require a ROM change, should be available in September.

Apple AppleTalk Internet Router

Apple's own Phase 2 offering is the AppleTalk Internet Router, a Mac software package to handle Token Ring, Ethernet, and LocalTalk gateways. Slated for release in "summer 1989" (which means your guess is as good as mine), it will cost \$399.

Bridges will offer more information about Phase 2 products and strategies for "making the migration" as it becomes available. Next month, look for an in-depth report on what's new in Phase 2 and how it will affect your network.

— Henry Bortman



ScanMan.™ Turning imaginations loose everywhere.

Pop any image up to 4" x 11" straight into any IBM personal computer or Apple Mac™!

Select one, two, three or four hundred D.P.I. Resize, rotate, flip and edit it. With the IBM version, use PaintShow Plus™ (included free) for coloring and shading, then port into any popular publishing program.

With the Mac ScanMan use the Clipboard™ to transfer the image to virtually any application — the Mac ScanMan works just like any Desk Accessory!

ScanMan for the PC	— \$309
Multi-Channel version	— \$369
Macintosh version	— \$499

For your nearest dealer, call:
800-231-7717

In California:
800-552-8885

In Europe:
+ + 41-21-869-96-56

Please circle 160 on reader service card.



Tables in *PageMaker*!

Aldus PageMaker



+

*TableTools*TM



=

Tables

in
Desktop
Publishing

To order PageMaker, visit your nearest authorized Aldus dealer.
Or, call 1-800-333-2538,
for a FREE information packet.*

To order TableTools, visit your nearest authorized Mansfield Systems dealer.
Or, call 1-800-872-3332,
In California 1-800-367-3332,
for a FREE information packet.*

*Offer good in U.S. and Canada only and expires September 30, 1989. Trademarks/owner: Aldus PageMaker and the Aldus logo/Aldus Corporation; TableTools/Mansfield Systems, Inc. Please circle 19 on reader service card.

Protects while you type!



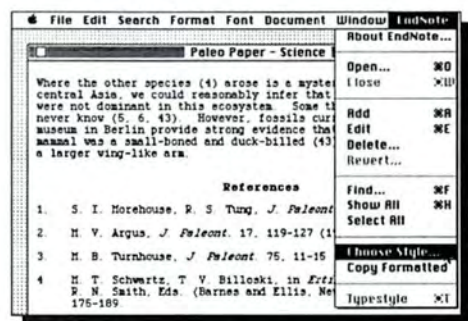
- Remains in Place while you use your computer.
- Avoids Costly Repairs by protecting delicate electronics from dust, spills, smoke, ashes, staples.
- Soft, Flexible, retains normal keyboard feel.
- Washable, Durable High-Tech Polymer lasts years.
- Hundreds of Models. SafeSkin is available for most PCs, laptops, workstations and clone keyboards.
- Office • Home • Factory • Classroom • Laboratory

List Price \$29.95. Please call or write for free color brochure. Dealer Inquiries encouraged.

SafeSkinTM
KEYBOARD PROTECTOR

Merritt Computer Products, Inc. 5565 Red Bird Center Drive
Suite 150, Dallas, Texas 75234/(214) 339-0753 • FAX (214) 339-1313
In Canada call 1-800-663-1061

Please circle 115 on reader service card.



Bibliographies in Word!

Keep a database of up to 32,000 references. Create bibliographies automatically in the style you need. Access your database from your word processor using the EndNote DA. Also works with MacWrite, WriteNow and WordPerfect. \$129. See Minifinder under databases.

EndNote

**A REFERENCE DATABASE
AND BIBLIOGRAPHY MAKER**

Niles & Associates, Inc., (415) 655-6666
2200 Powell, Suite 765, Emeryville, CA 94608-1809



"Almost like magic, the
bibliographic chores of your
writing task are finished"
(MacUser, February 89)

Please circle 48 on reader service card.

The configuration software that comes with NetBridge, Liaison, and InterBridge shows routing-table status information that can be useful for troubleshooting a network containing several routers. The Shiva Internet Manager software has excellent on-line help, and it can help you configure and obtain diagnostic information on Hayes InterBridges as well as on Shiva NetBridges. Unfortunately, Hayes' InterBridge Manager software (version 1.0D) is not fully compatible with the currently shipping Mac System and Finder (System Software 6.0.3). It can hang if

You'll have less trouble if you configure your router separately before you connect it to a network.

you're using MultiFinder with another program running in the background. You can avoid the problem by not running under MultiFinder when you run InterBridge Manager; by starting up your Mac from the InterBridge Manager disk that Hayes provides, which has an older System and Finder on it; or — if you have it — by using the Shiva software instead, which is compatible with current System software. Hayes says it is now shipping version 1.0E of InterBridge Manager, which fixes the problem. Current InterBridge owners can call Hayes for a free upgrade.

Special Features

Half-Bridging. With half-bridges, you can configure your network so that from Seattle you can print to a LaserWriter in New York and access a mail server in Dallas. Although we did not test half-bridging, both InterBridge and Liaison can be used as half-bridges to connect to remote AppleTalk networks through dial-up modems. In addition, Shiva and Solana offer separate half-bridge devices.

Configuration Passwords. Liaison, NetBridge, and I-Server can be configured with password protection so that curious (or malicious) network users cannot reconfigure a network.

Hidden Zones. Liaison, NetBridge, I-Server, and TurboBridge can hide certain zones from selected network users. This feature can be very useful when your network contains dial-in AppleTalk modems — or when pranksters are constantly printing to the big boss's LaserWriter.

Other Networks. Liaison can be used as a LocalTalk-to-EtherTalk or LocalTalk-to-Arcnet router instead of as a LocalTalk-to-LocalTalk router. It can also serve as a gateway between LocalTalk and Token Ring networks, using Apple's new TokenTalk card and software (which should be available by the time you read this).

Recommendations

If you are certain that a router is, indeed, the solution to your network problem, remember that reliability comes first. Speed will most likely be your second consideration. Cost and additional features should probably be your lowest priorities (although the dial-in capability offered by InterBridge and Liaison could be a critical factor for some).

The Hayes InterBridge is the oldest, most experienced LocalTalk router. Although it is also the most expensive (\$799) and far from the fastest, it has a proven track record. An InterBridge doesn't break. In addition, this router comes with built-in half-bridging.

Infosphere's Liaison (\$295) is also highly reliable when used on a dedicated machine or run in the background behind a server. However, don't try to run it as a LocalTalk-to-LocalTalk router on an individual user's workstation; you'll be asking for trouble. Like InterBridge, Liaison also can be used for half-bridging, and it provides many useful security features. It is fast, and, if you have a spare Mac Plus sitting around or run the program in the background on an AppleShare server, it's the least expensive. If you've purchased a dedicated Macintosh on which to run it, however, Liaison is the most expensive option.

The Shiva NetBridge (\$499) is faster and less expensive than the InterBridge, and, although we've heard complaints about NetBridges with older ROMs causing problems, our tests showed ROM version 1.03 to be reliable. The NetBridge comes with very nice configuration software. It is solidly recommended for those who want a hardware router.

Because the TurboBridge (\$499) and I-Server (\$695) are not 100-percent reliable, we do not recommend them at this time. ☹

For fun and a sense of adventure, Kee Nethery organizes the construction of large multivendor networks at trade shows. He can be reached at Kagi Engineering in Berkeley, California.

Product Directory

InterBridge

Hayes Microcomputer Products, Inc.
P.O. Box 105203
Atlanta, GA 30348
(404) 449-8791
\$799

I-Server

Solana Electronics
7887 Dunbrook Road, Suite A
San Diego, CA 92126
(619) 573-0800

Liaison

Infosphere
4730 S.W. Macadam Ave.
Portland, OR 97201
(503) 226-3515
\$295

NetBridge

Shiva Corp.
15 Second St.
Cambridge, MA 02141
(617) 864-8500
\$499

TurboBridge

Nuvotech, Inc.
2015 Bridgeway, Suite 204
Sausalito, CA 94965
(415) 331-7815
\$499

New! 2.0 Power Version

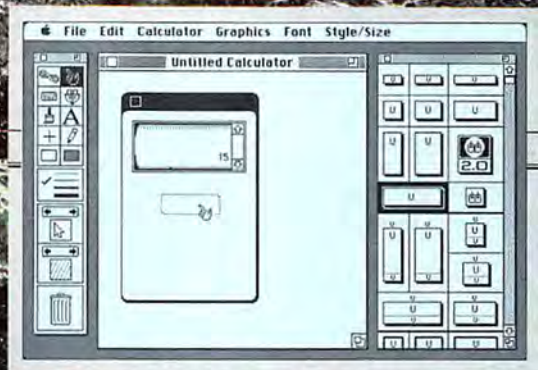
CALCULATOR CONSTRUCTION SET

"Nerd heaven."

—MacWorld Magazine, September 1988



—MacUser Magazine
Highest Rating, April 1986



Building a calculator is as easy as dragging parts onto a calculator case, then choosing their functions.

No programming required. You don't have to be a computer nerd to design and build the calculators of your dreams! Just start up **Calculator Construction Set** and drag parts onto a calculator case. When done, save your calculator as a real application or desk accessory! Even test your creation while it's still under construction.

We Kept it Simple! Just open one of our many pre-built calculator files, pull down "Save As" and voilà: instant calculator. Or alter the pre-built designs to fit your specs!



\$89.95. Runs on any Macintosh® and with Multifinder.® Call or write for specifications: (818) 700-9525.

Dubl-Click Software ♦ 9316 Deering Avenue ♦ Chatsworth, CA 91311

Please circle 109 on reader service card.

9-Track Tape Subsystem for the Macintosh™

Bridge the Macintosh
Communications
Gap with:

- Mainframes
- Minicomputers
- Microcomputers
- Networks



Qualstar's proven 1/2 inch 9-track MINISTREAMER™ tape subsystem brings full ANSI data interchange to the Macintosh via your SCSI interface port. Now you can exchange data files with virtually any other computer using industry standard 1600 BPI (bits per inch) tape.

9-Track tape, a mainframe standard, is the most reliable backup medium available. 3200 BPI is also provided with this system for high-capacity backup of your rigid disk. The MINISTREAMER tape subsystem includes a tape drive, software, cables, and complete documentation.

Our exclusive QUTAPE software is supplied on a standard 3 1/2 inch diskette and includes ASCII/EBCDIC data conversion, data transfer, blocking/deblocking, screen dump and disk backup utilities.

Qualstar is the market leader in desk-top 9-track tape subsystems. We can provide data interchange solutions for most popular microcomputers including the IBM PC, MicroVAX, SCSI, and VME bus systems.

Discover the many advantages 9-track tape has over other Micro/Mainframe links.

Call us today!

QUALSTAR™

9621 Irondale Avenue,
Chatsworth, California 91311
Telephone: (818) 882-5822

Macintosh is a trademark of Apple Computer, Inc.
MicroVAX is a trademark of Digital Equipment Corp.

Please circle 124 on reader service card.

This is two of the best computers
on the market.



It's a Macintosh, of course. But it's also a VAX. Thanks to a family of products from White Pine Software, Macintosh and VAX computers can communicate. These include emulators that allow the Macintosh to appear to a VAX exactly like a DEC terminal. And Reggie, which converts Macintosh graphics into DEC formats (ReGIS and SIXEL) for use by VAX applications or output devices.



And VMacS, which allows users to store and manage Macintosh files on the VAX's hard disks and tape drives.

For more information call or write: White Pine Software, 94 Route 101A, PO Box 1108, Amherst, NH 03031, (603) 886-9050.

Please circle 118 on reader service card.

ANOTHER SUPRA VALUE!

Suggested Retail

\$179⁹⁵



Actual
Size

Compatible

The SupraModem 2400 is 100% compatible with industry-standard, intelligent "AT" commands and all commonly used protocols (including Bell 103/212A, CCITT v.22, and CCITT v.22bis). Since the SupraModem operates asynchronously at **300, 600, 1200, and 2400** baud, you can communicate at whatever rate you need to. All these features let you use the SupraModem 2400 to connect with most modems being used today.

Affordable

In addition to its low price, the SupraModem 2400 will save you money by letting you communicate at 2400 baud, thus decreasing your on-line time. The SupraModem 2400 incorporates the advanced Intel 89024MS chip set. This design utilizes fewer parts, assuring operation long after the one-year warranty period.



Supra Corporation

1133 Commercial Way / Albany, OR 97321 U.S.A.
Phone: (503) 967-9075 / Fax: (503) 926-9370
Telex: 5106005236 (Supra Corp)

Available at your local dealer or call
(800) 727-8772
Orders Only

Easy to Use

The SupraModem 2400 is very easy to use. It features autoanswer and autodial (tone and pulse) for performing phone tasks, and it has a programmable-volume speaker for monitoring call progress. Storing phone numbers and user configurations is also simple because of the modem's programmable nonvolatile memory.

These features and others are explained thoroughly in the comprehensive *SupraModem 2400 Operator's Manual*. Once you understand the basics, the modem's quick-reference card makes finding command descriptions and other modem information quick and simple.

And to make it even easier to begin telecomputing, the SupraModem 2400 comes with introductory packages for several popular on-line services.

Special package available for Macs!

The SupraModem 2400MC combines the standard SupraModem 2400 package with popular telecommunications software and a Peripheral-8 to RS-232 cable for connecting the modem to your Mac. \$249.95.

Introducing the Exciting New
SupraModemTM
2400

Please circle 85 on reader service card.

SupraModem 2400TM is a trademark of Supra Corp. / MacintoshTM is a trademark of Apple Computer.

Star Performance

An active star can make your network easier to manage.

By Kurt VanderSluis

In previous articles, we talked about troubleshooting passive-star networks, networks without repeating devices. In this article, we will discuss how to troubleshoot an active-star network. You create an active star by placing a repeater at the center of a network and connecting the network wires to the repeater. Currently, the only repeater available for making an active star in an AppleTalk network is the Phone-NET StarController from Farallon Computing. By the time you read this, the TurboStar from Nuvotech should offer some competition. (Bridges will have a full report on these two devices when the TurboStar ships.)

The StarController and TurboStar are multipoint repeaters. Computing devices are usually connected to the repeater ports with ordinary telephone wire that is already installed in a building. Each port of a repeater has its own signaling hardware, and one or more devices can be attached to its wire segment. When two devices are on the same wire segment, they communicate with each other passively—without amplification. But when they are on different wire segments, they communicate through the repeater. The repeater receives a signal on one port, amplifies it, and sends the amplified signal out through the other ports. Because they amplify signals, repeaters greatly extend the total length of wiring you can have in your network.

Both repeaters are relatively expensive (more than \$1,500), but they cure one of the most pervasive network problems: guerrilla wiring. In most companies, the first LocalTalk networks were installed by users who strung the wires themselves, often without the company's

approval or consultation. This commando-style networking worked because of the forgiving nature of LocalTalk. Users didn't care if there were wires poking through the carpet as long as Command-P made a page pop out of the printer. The guerrilla networkers probably looped wires through the ceiling and around doorjambes, used inappropriate and illegal cabling, and made passive junctions with abandon.

Such practices are inappropriate for larger networks. Guerrilla wiring is hard to manage; hard to troubleshoot; messy; and hard to keep running in a busy, dynamic environment. If you've pushed your wiring past its electrical, functional, and aesthetic limits and need to clean it up, a multipoint repeater can solve some of your problems overnight.

Problems will still occur, however, and both the StarController and the TurboStar offer network-management capabilities that can help you solve them. Probably the most useful management tool is the line test, which is part of the StarController's StarCommand DA. The line test tells you the condition of the wiring attached to the ports. To perform the line test, you must first connect your Mac's modem port to the management port of the StarController.

When the test shows that the wiring is good, there are two possible interpretations, the first being that the wiring really is good.

The second interpretation stems from the fact that a StarController port with

nothing connected to it returns a "good" test value. You can use CheckNET or Inter-Poll, from a computer connected to a port other than the one being investigated, to check whether or not the devices on the suspect port are visible on the network. If they are visible, the connection is good, and the wiring is OK. If not, it's possible that the wiring on that port is no longer connected to the StarController. The Amphenol cable connection to the side of the StarController is flaky: Sometimes the connector gets cocked in its jack and disconnects some of the ports. There's a simple solution: Tape the connector in place with a piece of duct tape.

When the line test shows "marginal" wiring, it can mean you are losing some packets because the wires are too long or the termination is done improperly. But because of the way the line test is performed (which we won't discuss), you can get a "marginal" result on a port that

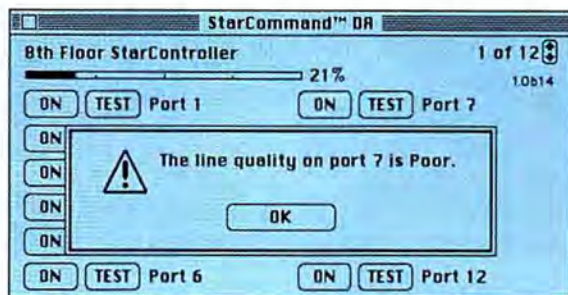


Figure 1: The StarCommand DA, which ships with Farallon's StarController, provides a line test that allows a network manager to check the integrity of the wiring attached to each of the StarController's 12 ports.

has no wiring problems at all—a good reason to perform the line test when you know your network's working well. If a port tests as marginal when the network is healthy, you'll know not to be overly concerned if you get a "marginal" reading when you're having trouble.

A "poor" indication means that the wiring definitely has problems. You can isolate this port from the network electrically via the management software or physically by unplugging it. You can then locate the wiring problem by using the techniques described in earlier articles (see "The Ghost in the Machine," April '89, and "The Exorcist, Part II," May '89).

Another MacUser Success Story



Mr. Roger Reed, President, ComputerWare

"MacUser is a bestseller at ComputerWare."

ComputerWare is a Silicon Valley legend—the first retailer in the country totally devoted to the Macintosh. It's the preferred product resource for thousands of sophisticated buyers, from small business people to senior Apple executives.

They flock to ComputerWare's two stores because they can count on in-depth product knowledge, great service, and competitive pricing. President Roger Reed has built the company's corporate account, international,

small business, consulting, and training divisions into a powerful merchandising channel for every major Mac vendor.

Which monthly Mac magazine matches the power of ComputerWare? Reed and his 125-member staff will tell you without hesitation: "MacUser is our best seller." They sell more copies of MacUser than any other monthly.

In-depth product reviews and MacUser Labs reports make a difference.

"We serve our customers by providing them with the best products, and protecting them from the worst," Reed says. "MacUser strongly supports us by rating products and giving specific recommendations based on their lab reports. It gives our customers the facts they need to make their brand decisions."

"Our sales staff also depends on MacUser," Reed continues. "The Minifinders are a very important starting point for comparing products. And the magazine's practical-

ity, usefulness, and high-quality format appeals to business buyers."

Roger Reed knows that Macintosh product specifiers depend on in-depth information to make their buying decisions. That's why more Mac buyers make more buying decisions with MacUser than any other Macintosh magazine.

Contact: Jeff Miller, Associate Publisher
(415)-378-5639



Call now for
orders and
free catalog

1-800-825-MACS
FAX • 1-818-501-3760



1-800-825-6227

Examine Us!

Dr. Mac provides new low pricing.



Check this symbol for
Dr. Mac's special
prescriptions.

MACWORLD

Please come see us at Booth
5609, in the World Trade Center.
Bring this ad for your mystery
discount.

BOSTON

Your Prescription For Success

SOFTWARE

3G GRAPHICS	
Images with Impact: Graphics	53
Images with Impact: Business	66
ADOBE SYSTEMS	
Adobe Illustrator '88	293
StreamLine	225
Fonts	Please Call
AEC MANAGEMENT SYSTEM	
AEC Info Manager	409
FastTrack Schedule	113
ALDUS	
Pagemaker	369
Freehand 2.0	339
Persuasion	359
ALTSYS	
Fontastic Plus 2.0	54
Fontographer	225
ALSOFT	
DiskExpress	45
Master Juggler	56
ASD SOFTWARE	
Fileguard	145
BEDFORD SOFTWARE	
Simply Accounting	199
BREKTHROUGH PROD.	
Market Master - Helps you sell	199
CAERE	
OmniPage 2.0	549
CENTRAL POINT	
Copy II Mac	25
PC Tools Deluxe Mac	48
CENTRON SOFTWARE	
Casino Master	45
Casino Master Color	52
CE SOFTWARE	
QuickKeys	64
Disktop	27
Quickmail 2.0	129
Quickmail 2.0 Ten User	229
CLARIS	
MacDraw II	319
FileMaker II	235
CRICKET SOFTWARE	
Cricket Draw	179
Cricket Graph	119
Cricket Presents	277
Cricket Color Paint	179
DATA VIZ	
MacLink Plus	129
Translators	111
MacLink Wang VS	291
MacLink + European version	149
DENEBA	
Canvas 2.0	172
Coach Professional	114
Coach Professional Network	253
DESIGN SOFTWARE	
MacTree+ Includes DS Backup	36
DISCOVERY SOFTWARE	
Chroma 32	235
Arkand	24
DMA	
MacTerm	75
DREAM MAKER SOFTWARE	
Capture Vol 1 or 2	91
MacGallery	26
ELECTRONIC ARTS	
Studio 8	299
Studio 1	96
FIFTH GENERATION	
Suitcase	44
Fastback II	113
FOX SOFTWARE	
FoxBASE +/ Mac 2.0	255
FoxBASE +/ Mac Multiuser	355
FoxBASE + Runtime / Mac	155
HAYES	
Smartcom II	85
Smartmodem 9600 V series	975
INFORMIX	
WingZ	255
INFOSHERE	
MacServe	140
LaserServe	53
LaserServe 5 Pak	166
Liason	166



QUARKXPRESS Version 2.11 \$469
QUARKXPRESS is the top-of-the-line professional publishing software. In one package it combines full featured word processing and excellent graphics handling with the most sophisticated page design, layout, & color specification tools. Use it to produce everything from top quality corporate brochures, annual reports & newsletters to manuals, tabloids & magazines.

INNOVATIVE DATA DESIGN	
Dreams	265
INSIGHT DEVELOPMENT	
MacPrint	85
INSIGNIA	
Soft PC	245
INTUIT	
Quicken	29
JAM SOFTWARE	
Smart Alarms	53
Multi-User (2 to 4)	106
KENT MARSH	
SmartSafe	85
Nightwatch	85
LANGUAGE SYSTEMS	
Fortran with MPW	298
LAYERED	
Insight Expert Accts Rec.	405
Insight Expert Gen. Ledger	405
Insight Expert Inventory Control	405
At Once	289
LEXPERTISE	
MacProof	117
MECA	
Managing Your Money	125
MICROSOFT	
Word 4.0	247
Excel 2.2	247
File 2.0	137
Works	195
Power Point	247
MICROLITICS	
Color	42
Word Finder	42
MONOGRAM	
Business Sense	266
Dollars & Sense	88
ODESTA CORPORATION	
Double Helix II	310
Double Helix II Multi User	275
GeoQuery	189
Data Desk Professional	275
OLDUVAI	
Read It	249
PARACOMP	
Swivel 3D	245
Model Shop	369
PRO PLUS	
Wall Street Investor 2.3	319
Wall Street Investor 3.1	445
QUARK	
XPress 2.11	469
Style	169
SILICON BEACH SOFTWARE	
Super Paint 2.0	125
Digital Darkroom	191
Supercard	129
SOFTWARE VENTURES	
Microphone II	215
SYMANTEC	
Mac SQZ	49
LightSpeed C	148
LightSpeed P	89

Symantec Utilities	62
More II	246
TRAVELING SOFTWARE	
Lap Link Mac	79
T-MAKER	
Write Now 2.0	109
TOPS	
TOPS for Mac	139
TOPS for DOS	109
TOPS Flashbox	156
TOPS Flashbox	115
TOPS Repeater	124
Teleconnectors	26
Inbox Starter Kit	169
Netprint	114
WOLFRAM	
Mathematica for SE	418
Mathematica for Mac II	696
WORDPERFECT CORP.	
Wordperfect	189

HARDWARE

ABATON	
Interfax Fax-modem	314
Quick Step Printer	3049
256 Gray Scale Scanner	1479
AOX	
DoubleTime-16	239
CAMBRIDGE	
MacLite Z88 Portable Comp.	759
CUTTING EDGE	
CE 800K Disk Drive	147
DATADESK	
Mac - 101 Extended Keyboard	139
DAYSTAR DIGITAL	
33/030 Accelerator II / IIx	4595
33/030 Accelerator SE	2295
Math Coprocessors available	Call
MC LocalTalk Interface Board	315
DAYNA COMMUNICATIONS	
3.5" Drive 1.44 M	619
DOVE COMPUTER CORP.	
030 Marathon 32 Mhz	999
MacSnap	Call
E MACHINES	
Monochrome for SE	1229
Monochrome for Mac II	1299
Color 19 inch	4565
EMAC	
Emac 20 D	499
Emac 40 Impact Plus - 19ms	769
Modem 2400 Baud with cable	205
Tape Back up 150T	1292
FARALLON COMPUTING	
MacRecorder	132
PhoneNET PLUS	33
PhoneNET PLUS (10 Pack)	219
PhoneNET Star Controller	1139
PhoneNET Punch Down Kit	66
Timbuktu	64
Timbuktu Remote	194
FUJITSU	
Laser Printer	3149
GENERAL COMPUTER	
Write Move	514
PLP Laser Printer Plus	1675



TOPS FLASHBOX \$115
FlashBox, is a plug-in device for Macs that upgrades the performance of AppleTalk networks without the expense of complications of Ethernet. FlashBox moves data between computers rapidly by increasing the data transfer rate of AppleTalk networks. This data rate increase means you can place more Macs on your network with little decrease in performance.

Business Laser Printer	3149
IRWIN	
Accelerator 25 Mhz	1199
KINETICS	
Ether Port SE 30L	593
Ether Port SE/030	593
Ether Port II	517
Fast Path 4	2084
LA CIE	
Cirrus 40 Meg	699
Cirrus 80 Meg	995
Cirrus 100 Meg	1025
MICROTECH	
45 Meg Removable Hard Drive	1059
MICROTEK	
Flatbed 256 GS 300DPI	1635
Color Scanner	Call
NEC	
Macsync	599
ORCHID TECHNOLOGY	
MacSprint II	239
MacFax/Modem 9600 Baud	444
PERIPHERAL LAND	
30 Turbo Effective access 14ms	599
50 Turbo - 14ms	749
Infinity 40 - 10ms	1175
Twin 40 - 10ms	2069
160i Internal - 8ms	1389
TurboFloppy 1.4	399
Large Capacity Drives	Call
POLAROID	
Data Rescue Disks (10 pack)	18
PRACTICAL PERIPHERALS	
2400 Baud External Modem	177
Mac Comm. Pac 2400	219
RASTEROPS	
ColorBoards	Call
SHIVA	
NetBridge	343
Net Modem	323
NetModem V2400	432
TeleBridge	343
SIGMA DESIGNS	
Pageview	799
Silverview	1499
ColorMax	3943
SUPRA	
2400 Baud External Modem	138
SYSTEMGATE	
Floppy drive 800K	145
TARGUS	
Mac Plus/SE Carry Case	56
Mac SE Ext. Keyboard Case	69
Imagewriter II Carry Case	46
THUNDERWARE	
ThunderScan 5.0	183
Lightning Scan	399
SIMMS	
1 Meg. 100 ns	Call

POLICIES

- Visa, Mastercard, and AMEX accepted.
- Credit card is not charged until order is shipped.
- California residents add 6.5% sales tax.
- To order call Mon - Fri, 9 - 10 EST. Sat Noon - 5 EST.
- Enquiries call (818) 501-6581. FAX# (818) 501-3760.
- All prices & policies subject to change without notice.

Shipping

- \$3. UPS Standard Air/Blue. Hardware over 10 lbs will be shipped ground.
- Same day shipping on orders placed by 8:45pm EST, if items are on hand.

Returns

- Defective software only will be replaced immediately by the same item. Call (818) 501-0861 for R.A. number before return. A restocking fee may apply.

Dr. Mac Inc.
14542 Ventura Blvd., Suite 200
Sherman Oaks, CA 91403

Fax Your CORPORATE, EDUCATIONAL & INTERNATIONAL ORDERS NOW

30 Day approved credit

Guaranteed

If you don't like it



HARDWARE 30-day money back GUARANTEE

No if's, and's or but's,
we want you to be happy
with your purchase.



SOFTWARE GUARANTEE

If it doesn't fit your
needs, we will refund
the purchase price
minus the applicable
trial fee. No hassles!



**OVERNIGHT
DELIVERY AVAILABLE**

Plus

**INSTALLATION
& TRAINING ...**
available anywhere in
the U.S.!

How To Order

• Use our toll free num-
ber for ordering, tech
support and free advice.
*The number applies in
all 50 states as well as
Puerto Rico and the Vir-
gin Islands. If you prefer,
we will also accept your
order via FAX.*

• We accept MasterCard
and Visa with no sur-
charge.

• We charge your pur-
chase when we ship
your merchandise — *not
before!*

LEASING is now availa-
ble to qualified business-
es. Call for details.

**Let us configure
your system solution!**

SYSTEMS

Mac IIcx B&W Full-Page System,
2 Mb RAM, 45 Mb Hard Drive,
Mac 101 Keyboard.....5100

Mac IIcx B&W Two-Page System,
2 Mb RAM, 45 Mb Hard Drive,
Mac 101 Keyboard.....5700

Mac IIcx 19" Gray Scale System,
2 Mb RAM, 45 Mb Hard Drive,
Mac 101 Keyboard.....6250

Mac IIcx 14" Sony Color System,
2 Mb RAM, 45 Mb Hard Drive,
Mac 101 Keyboard.....5700

Mac IIcx 16" Sony Color System,
2 Mb RAM, 45 Mb Hard Drive,
Mac 101 Keyboard.....7550

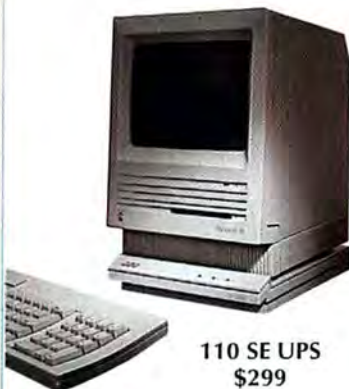
Mac IIcx 19" Sony Color System,
5 Mb RAM, 90 Mb Hard Drive,
Mac 101 Keyboard.....9750

Mac SE 030 w/1 SuperDrive,
2 Mb RAM, 45 Mb Hard Drive,
Mac 101 Keyboard.....4300

Mac SE 030 19" Sony Color System
w/1 SuperDrive, 5 Mb RAM,
90 Mb Hard Drive,
Mac 101 Keyboard.....9850

Mac SE w/2-800k Drives, FPD,
2.5 Mb RAM, 45 Mb Int Hard
Drive, Mac 101 Keyboard.....4000

Mac SE w/2-800k Drives,
2.5 Mb RAM, 45 Mb Int Hard
Drive, Mac 101 Keyboard.....3300



**110 SE UPS
\$299**

UNINTERRUPTABLE POWER SUPPLIES

330 XT299
450 AT375
MinuteMan 300429
MinuteMan 600695



"We're not happy UNLESS YOU ARE!"

We want you to become a repeat
customer. So we give you:

- discount mail-order prices
- superior service & selection
- an unbeatable hassle-free warranty
- toll-free tech support
- an unsurpassed return policy

And we do it all with a smile . . .
because that's what you deserve . . .

SCANNERS

Lightning Scan.....459
MacScan Flat Bed.....1495
MacScan Flat Bed (GS).....1995
Microtek MS 300QS.....1349
Microtek MS 300GS.....1679
Microtek MS 400GS.....2995
ScanMan399
Sharp JX 300 Color.....4295
Sharp JX 450 Color.....5895

ACC & OTHER PERIPHERALS

Bit Pad Plus 12x12 Tablet.....349
MacFlip (80 diskettes).....18
Mac 101 Keyboard.....149

COMMUNICATIONS SOLUTIONS

• **Software**
Acknowledge.....32
LapLink Mac.....17
Liaison.....17
MacLink Plus.....13
MacNet Starter Kit.....5
Microphone II.....22
Quick Mail (10 Users).....21
Red Ryder.....5
Timbuktu.....6
TOPS (Mac).....14
VersaTerm Pro.....17

• **Hardware**
Abaton InterFAX.....32
Anchor 2400.....16
Everex 2400.....19
Practical Peripherals
2400 Bundle.....23
Prometheus 2400 Bundle.....19
Shiva NetModem 2400.....45
SmartModem 2400M
(Internal Mac II).....45



**ZOOM
modem 2400
\$119**

ACCELERATORS

Dove Marathon 030.....95
Dove SE Marathon 020.....41
Dove 548S (with SCSI).....47
Dove MacSnap Plus 2.....29
Maccelerate SCSI Acc.....46
Orchid MacSprint.....24
Radius Accelerators.....Ca
SICLONE.....285
(w/ 68882).....395

TARGUS PREMIUM CASES

IW II Case.....4
Mac Plus Case.....5



**Deluxe Mac SE
Ext. Keyboard Case
\$75**

When you need to return something . . .

We are true pioneers when it comes to our return policy. In fact, we were the first company to offer returns. We offer a refund of the purchase price on all software except fonts, clip-art and special order items, minus the applicable trial fee (10-day minimum, plus 6 free days for shipping).

Unlike the competition, this offer covers over 1000 products, including those published by Microsoft, Aldus, Adobe, Ashton-Tate, Borland, Broderbund, Claris, Cricket, Letraset, WordPerfect, Mindscape and Caere.

WE'LL BUY IT BACK!

MONITORS w/Cards

E-Mach Z-21 IQ (GS)	2795
E-Mach Z-21 (Mac II)	1995
E-Machines Z-21 (SE)	1919
NEC Multisync (15")	1895
PCPC Shadowgraph	1795
Radius Solutions	Call
Sony 1302	1259
CALL! Other Monitors Available!	

We specialize in high-end graphics work stations.

33 MHz Mac IIx with 19"

RasterOps 32-bit Color System,
SCSI Accel, 8 Mb RAM, 320 Mb
Hard Drive, Mac 101 Keyboard,
Sharp JX 450 Color Scanner,
PostScript Color Laser Printer
.....33,000



RasterOps

ClearVue (Mac II)	1295
ClearVue SE w/ 16MHz 68000 Accelerator	1495
SE030 8-bit 19" Trin	4529
FrameGrabber Board	2085
16" Trinitron 8-bit	3095
19" Trinitron 8-bit	4295
19" Trinitron 32-bit	6795

Trade in your 108 or 104 Board
NOW!

BUSINESS

Aatrix Payroll Plus	159
Checkmark Multi-Ledger	284
Checkmark Payroll 4.0	209
Cricket Presents	289
Double-Helix II	345
Foxbase	206
In Sight Accounting	Call
Managing Your Money	125
MicroPlanner + 6.0	359
Simply Accounting	209
Systat	470

WORD & PAGE LAYOUT



Quark
XPress
\$459

Adobe Postscript Fonts	Call
Coach Professional	117
Fluent Laser Fonts (ea.)	50
Fontographer	215
FullWrite Professional	269
LetraFonts	59
More 2.0	255
OmniPage	569
Pagemaker 3.0	389
Quark Style	189
Read It! (OCR)	260
ReadySetGo! 4.5	285
Write Now 2	109

GRAPHICS

Adobe
Streamline
\$239



ClickArt EPS Illustrations	75
Canvas 2.0	159
Cricket Draw	169
Curator	75
Digital Darkroom	255
Dreams	279
Freehand	349
Illustrator '88	309
Image Studio	285
Images With Impact	59
Laser Paint II	359
MacDraft	151
MacDraw II	329
Pixel Paint	204
Smartsnap & The Clipper	47
Studio 8	319
Super 3D Enhanced	331
SuperPaint 2.0	133
Wet Paint vols. 1 - 16	45

PRINTERS

GCC Personal Laser PLUS	1799
GCC Business Laser	3395
Mitsubishi Color Laser	Call
Qume ScriptTEN	3395
Qume CrystalPrint	3295
Sharp JX 730 Color	2199

"You guys are super!...I really appreciate your caring attitude. ...you're always friendly and more than willing to talk me through whatever my problem is."

Sandy Thompson
S.A. Thompson
Trumbull, CT

CUTTING EDGE

CE Int 20	365
CE Int 32	379
CE Int 47	409
CE 65 (II/III)	509
CE 85 (II/III)	625
CE Ext 20	439
CE Ext 32	499
CE Ext 47	565
CE Ext 65	625
CE Ext 85	735
800k Ext Floppy	149

EVEREX

EMAC 20D	495
EMAC 40DL	635
EMAC 60DL	855
EMAC 80DL	1115
EMAC 40 (SE/CX)	645
EMAC 60 (SE/CX)	740
EMAC 80 (SE/CX)	995
EMAC FS140 (external)	1340
EMAC 60T (Tape Back-up)	665
EMAC 150T (Tape Back-up)	1120

PCPC

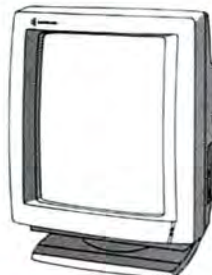
Erasable Optical 650 Mb	3795
Jetstream 8 mm Tape Backup	4299

PERIPHERAL LAND

1.44 Mb Floppy	369
Infinity Turbo 40	1045
Infinity Dual Turbo 40	1979
PL 70 (SE/CX)	729
PL 90 (SE/CX)	959
PL 160 (II/III)	1350
PL 300 (II/III)	2550
PL 635 (II/III)	3250

SAMSUNG

FPD with
video card
\$695



Trade-ins accepted...

we gladly take trade-ins on Mac CPUs and printers that are in good working order. For more information, call.

6-month warranty...

on Apple CPUs; 90-day warranty on other Apple products. Even though we aren't an authorized Apple dealer, we'll be glad to perform any covered repairs during the Apple warranty period.

To save you time, we'll also coordinate warranty work on products from other manufacturers through our office.

"We've been making Macintosh customers happy for four years! We were the first Macintosh mail order company to run its entire operation on Macs, so we understand just how important that technical answer can be to those of you who count on your Macs every day to help you earn a living. Our friendly staff of experienced Mac enthusiasts and computer consultants are always happy to answer your questions."

—Réal Provencher
President

Featured on the previous page are several members of our management team: (l to r) Barbara, Jim, Lew, Réal.

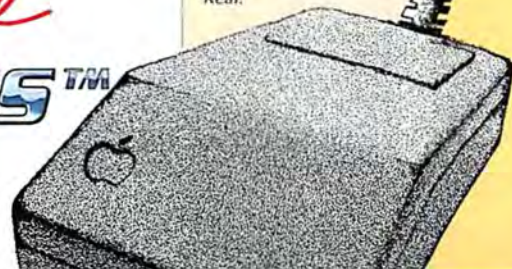


and Hardware
SOFTWARE THAT FITS™

P.O. Box 4028 • Humble, Texas 77347

1-800-972-3018

FAX 713-446-8499
713-540-2300



Never buy another ribbon!!!

Over 100,000 sold
since 1982

Average cost per
re-inking is 5 cents

Each MacInker shipped complete with free ink bottle, reservoir cover and ink dispenser



MacInker \$42.00

Immediate shipment - 30 days money back guarantee - Major credit cards

Order Toll Free 800-547-3303
in Oregon (503)626-2291- fax(503)643-5379

Special Offer. Order for >\$60.00 and say "I saw it in MacUser" and get a free mousepad or free photo-art disk. Order for >\$100.00 and get free key-beeper with flashlight combined (a \$15 value), or get a guaranteed, accurate LCD electronic pedometer, jogging & step meter & calculator for only \$15.00 (a \$40 value).

Computer Friends, Inc.

14250 NW Science Park Dr. Portland OR 97229

MacInker™, the original, automatic ribbon re-inker. MacInker mod 234IM re-inks Imagewriter I/II black & single color cartridges. The Universal MacInker re-inks hundreds of cartridge types (including the Imagewriter LQ, one color and multicolor) with suitable adapters. Proprietary, extra dark, dot matrix, lubricant ink yields better than new print quality and extends printhead life. New feltless reservoir for precise ink metering. Average number of re-inkings/cartridge is 60-100. With the optional Multicolor Adapter (mod M422, \$40.00) your MacInker re-inks 4-color Imagewriter II cartridges. Full range of accessories available, inks & cartridges: indelible ink, heat transfer etc. Colors: red, green, blue, yellow, purple, brown, orange, silver, gold. **Free catalog.**

Imagewriter I/II MacInker (mod 234IM)	42.00
Multicolor Adapter (mod M422)	40.00
Universal MacInker	68.50
Heat Transfer Adapter	35.00
Imagewr. cartr. 3.15/ea (min 6)	4-color 10.00/ea (min 2)
Imagewr. LQ cartr. 14.00/ea (min 2)	4-color 20.00/ea (min 2)
Extra ink bottle	3.00/ea pint 18.50
Shipping	4.50

LightFax 9624 FaxModem

\$749.00



One year warranty

LightFax 9624	749.00
LightScan 200 dpi	199.00
2400 b modem only	239.00

9600 baud fax and 2400 fully Hayes compatible modem in one. Full front panel control lights. Software features Background operation, NameCard data management, Scheduled Sending, Broadcasting, full input/output Journal and much more. Optional 200 dpi scanner for direct input into fax window or favorite paint program. Ask for bulletin "Facts on faxes".

1200 baud modem only	99.00
4 port 8 pin switch	50.00

Please circle 36 on reader service card.

Try then buy! Why take a chance?

MacStore™

You pay a low trial fee now, the balance only after you decide it's right. For over four years we've been helping people like you make intelligent buying decisions.

Ask about our new HyperCatalog with free bonus programs!

We have hundreds of other titles available for the Mac. If you don't see what you want... call us!

	Trial Fee		Trial Fee
Balance of Power	9.30	MacProject II	83.85
Battery Pack	8.80	Mac the Knife	Call
Beyond Dark Castle	8.80	MacWrite	17.95
Bulk Mailer+	44.72	Managing Your Money	27.22
Business Sense	61.25	Math Blaster	9.30
Calendar Maker	8.80	Microsoft Word	55.17
Certificate Maker	8.90	Microsoft Works	43.00
Click Art (Effects, Letters, Etc.)	8.80	MORE II	53.70
Coach Professional	22.95	Omnis 3 Plus	57.12
Concertware	Call	OverVUE	35.80
Copy II Mac	8.80	PictureBase	9.35
Cricket Draw	39.26	Pinball Construction Set	8.80
Cricket Graph	27.80	PosterMaker	8.80
Crystal Quest	8.80	QuickKeys	12.77
Dark Castle	8.80	Quicken	8.80
Deja Vu	8.80	Read-It! for ThunderScan	18.75
DeskPaint	8.80	Ready, Set, Go!	Call
Dollars & Sense	20.10	Red Ryder	11.65
Excel	52.75	Stepping Out	21.51
Falcon F16, Gato, Orbitor	8.80	Suitcase II	13.30
Ferrari Grand Prix	8.80	SuperPaint 2	26.48
Flight Simulator	8.80	Symantec Utilities	13.30
Fluent Fonts (all)	10.25	Tempo II	19.95
FoxBASE +/Mac	41.80	Will Writer/Maker	8.80
FreeHand	104.50	WriteNow	25.41
KidsTime	8.80		
MacCalligraphy	23.60		
MacDraft	33.84		
MacDraw II	66.91		
MacGolf	9.10		
MacInTax (Final SaleOnly)	49.95		
MacLabeler	8.80		
MacMoney	15.10		

60% off list sale

ACCESSORIES (over 250 hardware items)

Carrying Cases/Upgrades	Call
Box/10 Sony Disks SSDD /DSDD	13.80/15.95
KAO Disks 2DD Bulk ca.	1.19
Disk Drive Cleaning Kit	11.50

16 day trial period • Trial fee applies to purchase • Frequent customer bonus dollars
Credit cards aren't charged until your order is shipped • Low freight charges

800-827-0022

MacStore
1671 Executive Dr.
New Braunfels, TX 78130

The store logo is a trademark of MacStore,
the apple logo a trademark of Apple Computer, Inc.

We accept Visa,
MC, AMX and Discover
Commercial Accounts
Welcome - Prices
Subject to Change

Please circle 165 on reader service card.



Insurance For Fried Apples?

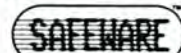
When your surge protector fails will your insurance save you? **SAFWARE™** computer insurance covers power surges, lightning, theft, fire, accidental damage and more! Full replacement of hardware, media and purchased software for as little as \$39 per year.

Total Value, Hardware, Media & Purchased Software	Annual Premium
up to \$2,000	\$ 39
\$ 2,001-\$ 5,000	\$ 69
\$ 5,001-\$ 8,000	\$ 89
\$ 8,001-\$11,000	\$109
\$11,001-\$14,000	\$129

For immediate coverage, information
and rates on higher coverages, call

1-800-848-3469

Locally 614-262-0559 On CompuServe, GO SAF



SAFWARE, The Insurance Agency Inc.
2929 N. High St., P.O. Box 02211, Columbus, OH 43202

Please circle 150 on reader service card.

MacLand

The Lowest Prices with Technical Support, Too!

WARNING: Beware of money-back offers on hardware! MacLand sells only NEW, NEVER USED merchandise. We will not send you re-packaged, slightly-used hard disks.

Summer Sizzler!

Externals

	Reg. Price	Sale Price
20 Megabyte		
Caché Systems 20 65ms	\$549.	\$449.
CMS Enhancements 20 32ms	\$549.	\$439.
MacBEST 20 65ms	\$499.	\$439.
30 Megabyte		
Caché Systems 30 40ms	\$559.	\$489.
CMS Enhancements 30 38ms	\$589.	\$509.
MacBEST 30 28ms	\$549.	\$499.
40 Megabyte		
Caché Systems 45 40ms	\$629.	\$549.
CMS Enhancements 45 40ms	\$649.	\$589.
MacBEST 45 28ms	\$599.	\$579.
Quantum 40* 19ms	\$699.	\$649.
60 Megabyte		
Caché Systems 60 40ms	\$729.	\$579.
CMS Enhancements 60 40ms	\$749.	\$699.
MacBEST 60 28ms	\$729.	\$649.
80 Megabyte		
Caché Systems 80 28ms	\$849.	\$679.
CMS Enhancements 80s 28ms	\$899.	\$769.
MacBEST 80 28ms	\$849.	\$749.
Quantum 80* 19ms	\$949.	\$899.
90-100 Megabyte		
Conner 100 25ms	\$999.	\$929.
MacBEST 90 18ms	\$939.	\$879.
Quantum 105* 19ms	\$1,099.	\$999.
140-173 Megabyte		
Caché Systems 150 16ms	\$1,499.	\$1,299.
CMS Enhancements 170 18ms	\$1,799.	\$1,589.
MacBEST 173 18ms	\$1,749.	\$1,659.
300-600 Megabyte		
CMS Enhancements 300 16ms	\$2,349.	\$2,169.
CMS Enhancements 600 16ms	\$2,999.	\$2,839.

Prices are good thru September 1989

SE Internals

	Reg. Price	Sale Price
20 Megabyte		
MacBEST 20 65ms	\$399.	\$339.
30 Megabyte		
Caché Systems 30 40ms	\$425.	\$375.
CMS Enhancements 30 38ms	\$479.	\$389.
MacBEST 30 28ms	\$449.	\$399.
40 Megabyte		
Caché Systems 45 40ms	\$499.	\$449.
CMS Enhancements 45 38ms	\$569.	\$489.
MacBEST 45 28ms	\$499.	\$479.
Quantum 40* 19ms	\$599.	\$569.
80 Megabyte		
Quantum 80* 19ms	\$889.	\$799.
100 Megabyte		
Conner 100 25ms	\$899.	\$829.
Quantum 105* 19ms	\$999.	\$899.

Mac II, IICX Internals

40 Megabyte		
MacBEST 45 28ms	\$499.	\$479.
Quantum 40* 19ms†	\$599.	\$569.
60 Megabyte		
Caché Systems 60 40ms	\$639.	\$499.
CMS Enhancements 60 40ms	\$649.	\$539.
MacBEST 60 28ms	\$629.	\$549.
80 Megabyte		
Caché Systems 80 28ms	\$729.	\$575.
CMS Enhancements 80 28ms	\$749.	\$669.
MacBEST 80 28ms	\$749.	\$679.
Quantum 80* 19ms†	\$889.	\$799.
90-100 Megabyte		
CMS Enhancements 90 18ms	\$999.	\$815.
Conner 100 25ms†	\$899.	\$829.
MacBEST 90 18ms	\$949.	\$825.
Quantum 105* 19ms†	\$999.	\$899.
150-173 Megabyte		
Caché Systems 150 16ms	\$1,429.	\$1,199.
CMS Enhancements 170 16ms	\$1,699.	\$1,489.
MacBEST 150 17ms	\$1,499.	\$1,279.
300 Megabyte		
CMS Enhancements 300 16ms	\$2,199.	\$1,889.
CDC Wren Runner 330 10.7ms	\$3,795.	\$2,595.
MacBEST 300 17ms	\$1,999.	\$1,899.
600 Megabyte		
CMS Enhancements 600 16ms	\$2,999.	\$2,779.
MacBEST 600 16ms	\$3,599.	\$2,775.

Removables Tape Back-Ups

	Reg. Price	Sale Price
44 Megabyte Removables		
CMS Enhancements 44 25ms	\$1,299.	\$999.
60 Megabyte Tape Back-Ups		
CMS Enhancements 60	\$749.	\$699.

Scanners

Microtek MS II	\$1,159.	\$1,089.
Microtek MSF 300Q	\$1,439.	\$1,299.
Microtek MSF 300G	\$1,699.	\$1,599.
Microtek MSF 400G	\$3,299.	\$2,959.

Accelerators, Printers, Memory, Monitors and More!

SyQuest Removable Cartridges (Will fit Any 44 Removable Drive)		
General Computer Business LaserPrinter	\$3,399.	\$2,999.
Personal LaserWriter	\$1,699.	\$1,549.
Qume		
Crystal Print Publisher	\$3,299.	\$3,199.
ScriptTEN Postscript Printer	\$3,299.	\$3,199.
Radius		
Radius 16 + Accelerator	\$739.	\$599.
Radius 25 Accelerator	\$1,249.	\$999.
Full Page Display +, SE, II	\$1,299.	\$1,099.
Two Page Display SE, II	\$1,849.	\$1,599.
Two Page Gray Scale II	\$2,995.	\$2,599.
SystemsGate		
800K External Floppy Drive	\$199.	\$145.

SIMMS In Stock, Call For The Lowest Price!

SAME DAY SHIPPING on all in stock items if orders are placed by 3 PM Mountain Standard Time.

ALL DRIVES are preformatted and tested by MacLand technicians.

All hard disk drives carry a manufacturers one year warranty except for the *Quantum drives, which have a manufacturers two year warranty.

†IICX Compatible

For Ordering and Technical Support Call 1-800-333-3353

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional \$5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express

Standard Air which is 1 to 2 day service. COD's Shipped by UPS 2 day air. Call for shipping costs. Products purchased in error are subject to a 20% restocking fee. All prices subject to change without notice. All products subject to availability.



5006 South Ash Avenue, Suite 101 Tempe AZ 85282 (602) 820-5802

Please circle 50 on reader service card.





5¼" DD 6²⁵ PER BOX	5¼" HD 11³⁰ PER BOX
3½" DS 11⁹⁵ PER BOX	3½" HD 28⁹⁵ PER BOX



3½" DS 11⁹⁵ PER BOX	3½" HD 28⁹⁵ PER BOX
---	---

<i>Bulk Diskettes</i>	PER EA Min. 50
3.5"SS - .94	
3.5"DS - .96	
3.5"HD - 2.64	

Media from the Surface Scientists

3.5" DS 10⁶⁵ PER BOX	<p>"COLORED" 3.5" DS 12²⁰ PER BOX</p>
3.5" HD 25⁶⁵ PER BOX	<p>BULK "CALL"</p>



- Delaware 1-800-451-1849
P.O. BOX 10247, WILMINGTON, DE. 19850
- Oklahoma 1-800-654-4058
P.O. BOX 1674, BETHANY, OK. 73008
- Nevada 1-800-621-6221
P.O. BOX 12396, LAS VEGAS, NV. 89112

Minimum order \$20.00. No Surcharge on Visa MasterCard. COD orders add \$3.00. Surface Shipping UPS add \$4.00 per 100 for 3½" or 5¼", add \$4.00 per 100 for 8". U.S. Mail delivery add 9%. Prices subject to change without Notice.

FAX (405) 495-4598

Please circle 120 on reader service card.

WHY MORE PEOPLE WILL BE BUYING MACINTOSH PRODUCTS ...

For dealers only. MacUser magazine and Ingram Micro D have joined forces to offer resellers the *Macintosh Pocket Selling Guide*. It's a pocket-sized reference guide packed with everything a salesperson needs to better explain today's advanced Mac Products.

Some of the Guide's features include:

- A complete listing of MacUser's highly-respected MiniFinders. These capsule reviews have long been used by retailers to guide buyers in their product purchase decisions.
- A complete industry directory that lists support information for every Macintosh vendor.
- A complete glossary that defines many of the commonly-used terms in the Macintosh market.

More power to you.

The most powerful part of the PSG is the "Sales Briefs." Eye-catching pages that summarize the most important facts about individual products, enabling a salesperson to quickly pass on vital information to potential buyers. You'll make more sales using the "Sales Briefs."

If you would like more information about the MacUser/Ingram Micro D *Pocket Selling Guide*, contact Ingram Micro D.

The BEST MAC DISKS

Quality User
Supported
Software.
Works with all
MAC Systems

\$7 Each
Buy
1-4
Disks

\$6 Each
Buy
5-14
Disks

\$5 Each
Buy 15
or more
Disks

So easy to Use

- ▼ No Computer Experience Necessary
- ▼ Instructions for each Order
- ▼ FREE Phone Support

So Easy to Order

- ▼ FREE Membership ▼ FREE 800-# for Orders
- ▼ FREE Same-day Shipping
- ▼ UPS 2nd Day Air Service when you need it Now!
- ▼ FREE Catalog ▼ Your Satisfaction Guaranteed

NEW ADDITIONS

- ☐ **Songs 2 (2307)** - Contains 40 concertware songs and a player
- ☐ **MACart 2 (2403)** - Over 30 animal art pictures with viewer.
- ☐ **Painting Tools (2408)** - Includes several programs to get you started painting.
- ☐ **MACFonts 2 (2411) (800K)** - Many of your favorite picture and art font styles.
- ☐ **Writing Tools (2508)** - Helps you write and correct that paper or essay you got to get done. (this one really comes in handy.)
- ☐ **Desk accessories 1 (2520)** - Over 40 Dest Acc. for business, utilities, and just plain fun.
- ☐ **Stratego (2703)** - Just like the "classic" strategy game board game.
- ☐ **Checkers (2725)** - Try to beat the MAC or a human. (Multiple levels to choose from)
- ☐ **Blackjack Tutor (2730)** - Teaches you to play, and to increase your odds of winning.
- ☐ **Risk (2731)** - Try to conquer the World. (up to six can play!)
- ☐ **Spacestation Pheta (2732)** - Climb, Jump, and run through the spacestation picking up keys before you run out of oxygen.
- ☐ **Crossword (2733)** - Play the crossword puzzles provided for you, or create your own.
- ☐ **Blackjack & Poker II (2734)** - Includes three different styles of Blackjack play.
- ☐ **Baseball (2735)** - Control the Pitcher, batter, and fielder.

TOP 40



TOP 40



TOP 40

BUSINESS

- ☐ **MACmail (2000)** - A super mail list manager for MAC. Stores names, addresses, and other vital information. (Also prints labels.)
- ☐ **Bi-Plane Spreadsheet (2010)** - An extremely powerful and complete program with a multitude of options and functions.
- ☐ **Home Inventory (2012)** - Keeps track of all your personal items, expenses, and budgets.
- ☐ **Accounting & More (2016)** - Has a cash accounting, and a loan evaluating program.

EDUCATION

- ☐ **Stars (2102)** - Star charting-Astronomy (Breathtaking graphics and really fun education.)
- ☐ **Math Tutor (2104)** - Several fun math quiz games. A really great educational tool for kids.
- ☐ **Typing Tutor (2108)** - It's easy to improve your typing skills with this excellent tutor.
- ☐ **Teacher (2112)** - Allows you to track grades and create quizzes.
- ☐ **Spelling Tutor (2114)** - Listen and learn how to spell. (Requires MACinTalk)

UTILITIES

- ☐ **Menu Utilities (2200)** - Use these to edit and install menus.
- ☐ **Disk Utilities (2202)** - Disk and file recovery tools that everyone should have - just in case.
- ☐ **Vaccine (2204)** - Programs that will check for, eliminate, and protect against many computer viruses.
- ☐ **Screen Dump (2206)** - Allows you to print anything on the screen to your printer or a disk.
- ☐ **Disk Librarian (2210)** - A complete disk cataloging database program.

CREATIVITY

- ☐ **MACinTalk (2302)** - Allows your MAC to utilize its speech ability.
- ☐ **Songs (2306)** - Over twenty musical selections with a player utility.
- ☐ **Calendar Maker (2400)** - Make your own monthly calendars and monthly planners.
- ☐ **MACFonts (2410)** - Several new font styles for use with your Word Processor or Desktop Publishing programs.
- ☐ **Banner Maker (2430)** - prints large or small banners using the imagewriter printer.

GAMES

- ☐ **Football (2700)** - Be a computer desk quarterback (choose to be any NFL team.)
- ☐ **Billiards (2701)** - Fantastic graphics and extreme realism. Plays several different styles.
- ☐ **Blackjack (2702)** - Includes great Blackjack and Poker games.
- ☐ **Space Invaders (2704)** - Defend against the aliens in three great space games.
- ☐ **Donkey Doo (2707)** - Like "Donkey Kong." Has unlimited levels.
- ☐ **Casino Fun (2708)** - Craps, roulette, and slot machines - The fun of Vegas without the risk!
- ☐ **MAC Landing (2710)** - Like the great "Defender" game. Great graphics and sound.
- ☐ **Missile Command (2711)** - Three versions of the popular arcade hit.
- ☐ **Monopoly (2712)** - Play against the computer or a human. (Great graphics & sounds.)
- ☐ **Wheel (2713)** - Like TV's "Wheel of Fortune" (Sorry Vanna not included with your order.)
- ☐ **Backgammon (2714)** - Try to outplay your MAC! (Before it's too late!)
- ☐ **Solitaire (2716)** - A whole slew of great styles and versions.
- ☐ **Centipede (2718)** - Two excellent versions of the arcade game everybody loves.
- ☐ **MACYahtzee (2719)** - Play Yahtzee on your MAC. (1 to 4 can play)
- ☐ **Destroyer (2720)** - Two versions of "Battleship" Has great sound and allows you to play against a human of the MAC!
- ☐ **Tank (2727)** - Tank battle against the MAC!
- ☐ **Concentration (2728)** - Like the TV game, but you match icons instead of prizes
- ☐ **Super Pinball (2750)** - Many great pinball games. Great sound and fast action!
- ☐ **Zodiac Pinball (2754)** - More great pinball games - Based on the signs of the Zodiac.
- ☐ **Adventure 1 (2775)** - "Radical Castle" is one of the best adventure games of all time. Amazing graphics and sounds!
- ☐ **Adventure 2 (2776)** - Be warned "Psychotic" is not for everyone. You become Jason and go on a killing spree. Fantastic sound and graphics. (Requires an 800K drive.)

HYPER-CARD

To run these Hypercard stacks you must have "Hypercard," an 800K drive and at least one Meg of memory.

- ☐ **Business 1 (2800)** - Includes Checkbook, Checkwriter, Hypercheck, Bill Tracker, Appointment Master, and much more!
- ☐ **Business 2 (2801)** - Comes with Stock Helper, Hyperstocks, Spread, Hyper Payroll, Shareware Payroll, Personal Financier, and other great stacks!
- ☐ **Education 1 (2820)** - Spelling Tutor, Finger Spell, Spelling 2, Vocabulary Stack, and speller.
- ☐ **Education 2 (2821)** - Includes Heather's Multiplication, Heather's Notes, Time for Heather, Childrens Literature, and Hyper Zoo Big.
- ☐ **Music 1 (2840)** - Learn Guitar with: The Guitar Tutor, Guitar Tuner, Guitar Chording, Keyboards, and Common Sounds.
- ☐ **Music 4 (2843)** - Great Music Storage & More; Record Stack, Music Library, CD Collection, Music Collection, Six Stack.
- ☐ **Graphics 1 (2856)** - Slide Show, Animation Stack, Visual Effects, Pict. Stack, Clip Art, and much, much more!
- ☐ **Games 1 (2870)** - Adventure, Adventure Stack, Criminals, Hyper Craps, and Bowling scores. (Many hours of fun!)
- ☐ **Utilities 1 (2900)** - Over 15 Utilities for Menus, Disks, Printing, Archiving, Labeling, etc.
- ☐ **Misc. App's. 1 (2930)** - Time Keeper, Quick Memo, Month at a Glance, Hyper Wallet, and several more including: Las Vegas, LeLotto, Ohio Lotto, Hyper Alarms, etc.

Name _____

Address _____

City _____ State _____ Zip _____

Phone (_____) _____

Visa/MC _____

Sig. _____

Exp Date _____ ☐ Send Catalog

Disks Ordered _____ x _____ \$ _____

☐ SHIPPING Free U.S. \$ _____

Foreign Add \$4

☐ COD \$ _____

(add \$4 if you require COD)

☐ U.P.S. 2nd Day Air (Add \$3) \$ _____

TOTAL \$ _____

☐ Check/MO ☐ Visa/MC ☐ COD

**Software
Excitement!**

P.O. Box 3097 • Central Point, OR 97502

ORDER TODAY

1-800-444-5457

MacUser MARKETPLACE

HARDWARE 281-285

BAR CODE	281
CABLES	281
COMPUTER SYSTEMS	281
DATA ACQUISITION	281
DISKETTES	281-282
GENERAL	282
INSURANCE	282
MEMORY UPGRADES	282-284
NETWORKING	284
PERIPHERALS	284
PRINTERS	284
SCANNERS	284
SECURITY	284
USED EQUIPMENT	285

SOFTWARE 285-290

ACCOUNTING	285
BAR CODE	285
BUSINESS	285-286
DESKTOP PUBLISHING	286
EDUCATIONAL	286
EMULATION	286
ENGINEERING	286
ENTERTAINMENT/GAMES	287
FINANCIAL	287
FONTS	287
GENEALOGY	287-288
GRAPHICS	288
LANGUAGE TOOLS	288
MUSIC/MIDI	288
PUBLIC DOMAIN	288-289
RELIGION	289
SCIENTIFIC	289
STACKWARE	289-290
STATISTICS	290

MISCELLANEOUS 290-292

ACCESSORIES	290-291
CATALOGS/PUBLICATIONS	291
DATA CONVERSION SERVICES	291
DESKTOP PUBLISHING SERVICES	291-292
INSURANCE	292
MAILING LISTS	292
RECRUITMENT	292
SERVICES	292
SUPPLIES	292

ADVERTISING RATES AND INFORMATION

MacUser Marketplace is a special economical section for product and service listings.

Advertisements are grouped by category and sold by column inches. Second color option available.

Standard Directory Listings are also available for a minimum of 3 issues at \$375.00 per issue (\$1,125.00 total).

For additional information call 212-503-5115.

CLASSIFIED ADVERTISING STAFF

One Park Avenue, New York, NY 10016
(212) 503-5115 or (800) 825-4ADS

<i>Group Advertising Director</i>	<i>Sales Manager</i>
Kathryn J. Cumberlander	Ron Kost
<i>Group Sales Manager</i>	<i>Advertising Coordinator</i>
Daniel L. Rosensweig	Wanda D. Brown
<i>Production Director</i>	<i>Advertising Support</i>
Anne R. Brockinton	Manager
<i>Sr. Production Coordinator</i>	Monica Dixon
Bessi Dion	

ACCOUNT MANAGERS

DENNIS M. LEAVEY (212) 503-5111
 CA (ZIPS 93000 & UP), LA, MN, IL, CANADA, OH, KS, IA, KY, TN, CO, AK, AL, AR, MS, NB, NM, ND, IN, GA, OK, SD

MARY JO NASH (212) 503-5140
 CT, MA, ME, NH, NY, RI, ID, MT, MD, DC, DE, HI, OR, SC, VA, WV, PA, WY, CA (ZIPS 92999 & DOWN)

WESLEY WALTON (212) 503-5136
 MI, VT, WA, NC, BC, NJ, FL, AZ, UT, TX, MO, NV, WI

MacUser MARKETPLACE

HARDWARE

BAR CODE

BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II

Connects on keyboard or ADB
Requires no additional program or port
Does not affect keyboard or mouse
Industrial quality, heavy-duty units
Also available

SmartCard encoder/reader
Magnetic encoder
Code 39 UPC & Printing Software
Portable Bar Code Reader

TPS Electronics
4047 Transport Street
Palo Alto, CA 94303
415-856-6833

Telex: (Graphnet) 371 9097
FAX: 415-856-3843

CIRCLE 200 ON READER SERVICE CARD

CABLES

CABLES
AppleTalk™ & PhoneNet™
Compatible Kits
Cables for most Apple
and Compatible Products
Cables are Molded Tested
and 100% Guaranteed
Dealer Inquires Welcome
COMPUTEL INC.
26 North 26th St
Kenilworth NJ 07033
Tel (201) 241-5400
Fax (201) 241-5999
CIRCLE 201 ON READER SERVICE CARD

COMPUTER SYSTEMS

DISCOUNT MACINTOSH

Mac Plus.....	\$1295
Mac SE 2drive.....	\$2245
Mac SE 40mb.....	\$2745
Mac SE/30 CPU.....	\$3095
Mac SE/30 40mb.....	\$3495
Mac SE/30 80/4mb.....	\$4395
Mac IICX CPU.....	\$3495
Mac IICX 40mb.....	\$3895
Mac IICX 80/4mb.....	\$4795
Mac IICX 80/4mb.....	\$5495
Apple color monitor.....	\$750
Apple 8 bit video card.....	\$495
Apple keyboard.....	\$100
Apple ext keyboard.....	\$175
Imagewriter II.....	\$450
Imagewriter LQ.....	\$995
Laserwriter NT.....	\$3595

KIWI COMPUTERS

P.O. Box 67381
Los Angeles CA 90067
(213)553-4507

Fax (213)286-9667
Mon-Fri 8.30am-4.30pm

Apple and Macintosh™ Apple Computer

CIRCLE 204 ON READER SERVICE CARD

AMERICA's
**LOWEST
PRICED**

TM APPLE COMPUTER INC.

Macintosh
COMPUTER PACKAGES
SEs - Mac IIs - Laser Printers
Hard Drives - Monitors - Scanners
CALL FOR FULL
SYSTEM PACKAGE PRICING TODAY!
800 672-8804
CIRCLE 206 ON READER SERVICE CARD

DATA ACQUISITION

MACPACQ

Use your Mac as a digital oscilloscope & chart recorder. A complete data acquisition & control system. 8 channel A/D, 8 digital I/O, 64K RAM. Optically isolated, line or nicad powered. Runs remote or connected to Mac. Great software interface provides for powerful and flexible system. \$1195 complete.

Biopac Systems
5960 Mandarin Dr. Suite D5
Goleta, CA 93117
(805)967-6615

DISKETTES

SP Spring-Pik Diskpenser

HANDIEST EVER!

- Everyday Use / HD Backup
- Each Unit holds 14 Disks
- Disks **SPRING** out for removal
- Custom Disk Labels included
- Fold down front Dust Cover
- Units Nest for greater storage
- Xtra Brackets & Labels avail.
- Units remove easily from P/S Brackets

Only \$12.95 each + \$2.00 Shipping

Computer Extras - P.O. Box 276
Brookport, New York 14420
800/444-2167 - C.O.D.

COMPUTER SYSTEMS

800 PC-RENTL

\$189
per mo.



MAC SE

Also Available:

- IBM PS/2 50Z, 70, 80
- Compaq Deskpro 386S, 386E, Portable III, SLT/286
- Macintosh SE, SE/30, Mac IICX
- Apple Laser Writer NT, NTX
- HP LaserJet Series II

*Next day
anywhere
in the
U.S.A.*

800 PC-RENTL

Call Toll Free 800 727-3685

CIRCLE 203 ON READER SERVICE CARD

Lisa/Mac XL Users

SCSI is Here !!



LisaDAC Sound Card
Only \$139.95

We carry all products for the Lisa/Mac XL. Give us a call.

Dafax Hotline: 800 • 782-7823
Orders & info: 800 • 323-1751
215-574-0357/Fax# 718-746-1071

Dafax • 14 North Dr. Malba NY 11357

CIRCLE 202 ON READER SERVICE CARD

LOW PRICED MACINTOSHES

--- SELL - BUY - TRADE ---

OUR INVENTORY OF SLIGHTLY USED MINT CONDITION MACS WILL SAVE YOU HUNDREDS OF \$3 OVER THE PRICE OF A NEW MAC. WE ALSO CARRY A COMPLETE LINE OF NEW & USED MAC SYSTEMS, PERIPHERALS & HARDWARE. SELLING YOUR MAC EQUIPMENT? CALL US FOR A TOP \$3 OFFER. CURRENT SPECIALS!!!!!!

MAC SE 2 DRIVES W/KB	\$1999
MAC SE 2 HD W/KB	\$2350
MAC II, 2 MEG, COLOR, 4 HD \$4499	
MAC PLUS	\$1180
MAC 110 HD EXTERNAL	\$975
ALL OTHER EQUIPMENT	CALL

OPEN EVENINGS & WEEKENDS
CALL NOW! (415) 968-9026
MP-COMPUTER MICRO SYSTEMS
P.O. Box 1141, Mt. View, Ca.
94042-1141

MacUser Marketplace

Standard directory listings available for a minimum of 3 issues at \$375.00 per issue (\$1,125.00 total).

Call (212) 503-5115
or (800) 825-4ADS

MacUser Marketplace
To place your add call
(212) 503-5115 or (800) 825-4ADS

MacUser MARKETPLACE

DISKETTES

FREE Sony® Beach Towel

When you order 50 or more
Sony® 3.5" DSDD
(1.0 MB) Diskettes -50/Pack

87¢ 500+

89¢ Less than 500

➤ You must mention this ad to receive a **Free Towel**. While supplies last.

3.5" Disk Storage

\$2.99 12+

\$3.99 Less than 12

Toll Free: 800-258-0028

FREE Catalog. Complete line of quality supplies for your computer.

FOREIGN INQUIRIES INVITED
Minimum Order \$25.00. Prices Subject to Change. Terms to well-rated firms.

Precision Data™
P.O. Box 8367
Grand Rapids, MI 49518
616-452-3457 • 313-645-4980
FAX: 616-452-4914

CIRCLE 207 ON READER SERVICE CARD

Reclaims Desk from Disks

The VDS 240

Vertical Disk Storage
• Holds 240 Disks
• Mounts on Wall
• Fits Desk Space



"It's the only way to store disks"
—Jeff Walker, owner, MacOrchard

To Order: 1-800-942-4008

Vertical Disk Storage • P.O. Box 7515 • Ft. Wayne, IN 46807 • 219-352-2007

CIRCLE 208 ON READER SERVICE CARD

INSURANCE

INSURE YOUR COMPUTER

Safeware provides full replacement of hardware, media and purchased software. As little as \$39 a year provides comprehensive coverage. With blanket coverage, no lists of equipment are needed. One phone call does it all! Call 8am to 10pm ET (Sat. 9 to 5).
SAFWARE, THE INSURANCE AGENCY INC.
2929 N. High Street, P.O. Box 02211
Columbus, OH 43202
(800)848-3469 (NAT) or
(614)262-0559 (OH)

GENERAL

We BUY Mac's & Mac Stuff!!

We Buy, Sell, & Horsetrade Popular Computers!!

**Mac Parts
Call**

**Shreve
Systems**

2421 Malcolm Street Shreveport, La. 71108

Fax 318-865-2006 **visa/m.c. O.K.** **318-635-1121**

CIRCLE 209 ON READER SERVICE CARD

Everex 20 meg. \$495.

Used Mac's-----CALL

Mac Service Part Exchanges
Power supplies • 800K drives • Logic boards
Genuine Apple parts • 90 day warranty
Special program for dealers & service companies

Call toll-free: 800-274-5343

Pre-Owned Electronics, Inc.

Voice: (617) 891-6851/Fax: (617) 891-3556

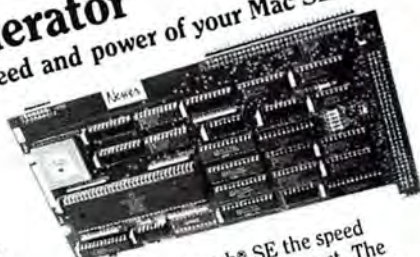
CIRCLE 210 ON READER SERVICE CARD

MacUser Marketplace

To place your add call
(212) 503-5115 or (800) 825-4ADS

MEMORY UPGRADES

MacSElerator™ doubles the speed and power of your Mac SE!



**Memory Expansion
SIMMs From
Newer™ Technology**

- Guaranteed Same Day Shipment
- University and Corporate Purchase Orders Accepted
- Ask about our Exclusive Extended Warranty

Give your Macintosh® SE the speed of a Mac II at a fraction of the cost. The MacSElerator™ accelerator board features a 16 MHz, 68000-based microprocessor. An optional 16 MHz 68881 "plug-in" math co-processor lets you tackle technical applications under the Apple® SANE Environment.
MacSElerator™ is compatible with all your current software and hardware, and offers simple installation.

Available for immediate delivery!
Call Our Memory Hotline For Prices and Discounts
1-800-678-DRAM (678-3726)

4MB
High Profile
16 - 32MB For Mac IIx
Perfect For A/UX

1MB
High Profile - Low Profile
16 - 32MB For Mac Plus, SE, SE 30,
2 - 8MB For Mac Plus, SE, SE 30, II,
IIx and IIcx

256K
Low Profile
1 - 2MB For
Mac Plus,
SE, SE 30, II,
IIx and IIcx

In Canada Contact: Tallgrass Technologies, Canada, Inc.
1775 Meyerside Drive #1 • Mississauga, Ontario L5T 1E2
(416) 673-3244 • FAX (416) 673-3926

CIRCLE 211 ON READER SERVICE CARD

**Newer™
TECHNOLOGY**

1117 S. Rock Rd., Suite 4
Phone (316) 685-4904
FAX (316) 685-9368
Wichita, KS 67207

UPGRADES!

512Ke - Plus \$295
128/512K - Plus \$625

We buy and sell good used equipment also!

Peripheral Outlet

314 S. Bdwy • Ada, OK 74820

(405) 332-6581

CIRCLE 212 ON READER SERVICE CARD

SIMM MEMORY MODULES:

Memory Module Technology

FOR MACINTOSH™ PLUS, SE & II'S
UPGRADE KITS FOR: 1, 2, 4, 8, MEG

MEMORY CHIPS-ALL SPEEDS
1 MEG & 256K MODULES
IN STOCK FOR IMMEDIATE DELIVERY

10291 EAST GRAND RIVER BRIGHTON, MI 48116

1(313)229 9303

FAX 1(313)229 5893

CIRCLE 213 ON READER SERVICE CARD



Get the best SIMMs in town!



Since 1984, we've given you: • Same day shipping. • Corp. and univ. PO acceptance. • Excellent free tech. support. • A Lifetime Warranty; • A 30 Day Money Back Guarantee. Get a free professional Macintosh opening kit (Includes Torx driver, pry tool, and a wrist strap) with the purchase of 4 simms. Opening kits are sold separately for \$19.95. Turbo Technologies, Inc. • 112 Benton Avenue • New Hyde Park, NY 11040 • (800) 542-7466 • (516) 877-7777 • FAX (516) 877-7784

Call Turbo Tech—(800) 542-7466!

CIRCLE 290 ON READER SERVICE CARD

MacUser MARKETPLACE

MEMORY UPGRADES

- 256k, 1 Meg, 4 Meg
- All low profile
- Japanese manufacturer
- Lifetime warranty
- Same day shipping

SIMMs
(800) 622-1722
(408) 559-8544

- Visa, MC, COD and University POs accepted.

PSI
2005 Hamilton Ave. #220
San Jose, CA 95125
CIRCLE 214 ON READER SERVICE CARD



One Plus One™ = 4

4 Megabytes of memory for your Mac® Plus

No leftover memory modules to deal with.

Levco's One Plus One™ and two 1 megabyte SIMMs gives your Mac® Plus 4 megabytes of memory for just **\$600.00**

Levco Sales 6181 Cornerstone Court East
Phone (619) 457-2011 San Diego, Ca. 92121

Mac is a registered trademark of Apple Computer, Inc.

CIRCLE 215 ON READER SERVICE CARD

1 Meg Simms \$129

100 Nsec Dip Simms
Lifetime Warranty Immed Delivery

Simm Adapter

Adds 4 Simm Sockets to 128 /512K Mac. Includes a built in SCSI Port

0 Meg \$199, 1Meg \$299

2M \$469, 2.5 M \$519, 4M \$719

Dealers Wanted

Digi-Graphics

764 E Village Way

Kaysville, Ut 84037

(801) 544-2009

CIRCLE 219 ON READER SERVICE CARD

MAC MEMORY

One megabyte SIMM modules **in stock** for your

Mac Plus, SE, or Mac II.

Immediate delivery.

Fully guaranteed.



408-973-8559

TRONIX

Cupertino, CA 95014

CIRCLE 220 ON READER SERVICE CARD

1 MEG SIMMS-LOWEST PRICES

U.S. made 1 meg simms for Macintosh. Speed: 80 & 100 n/s cmos chips. Factory Tested. All inquiries Welcomed.

Sharp color Scanners-\$3795

Spark 44 meg removable hard disk-\$1050.

Spark video card for Mac SE 30-\$450.

SPARK INTERNATIONAL, INC.

P.O. Box 314

Glenview, IL 60025

(312) 998-6640

FAX (312) 998-8840

RAM

Haven't you waited long enough?

Upgrade your Mac Plus, SE or II with 1 megabyte SIMMs modules. Low-profile and DIP mounted SIMMs available in 120ns and faster. Call for current price. We are the lowest.

HARDWARE HOUSE 1-800-RAM-4MAC

3440 Market St., Philadelphia, PA 19104 (215) 387-5806, Fax: (215) 386-4624

CIRCLE 216 ON READER SERVICE CARD

ONE MEG SIMMs

Direct from manufacturer. Available immediately in both surface mount and DIP SIMM format. Call for current pricing information. MasterCard/Visa

SIET MICRO ELECTRONIC TECHNOLOGIES INC.
35 South Street Hopkinton, MA 01748 (508) 435-9057

CIRCLE 217 ON READER SERVICE CARD

1 MEG SIMMS

The King of SIMMS
Wholesale Prices

- Low Profile In
- 1 Year Warranty Stock
- Mfg. Chip on Mfg. Board



Computer Centers, Inc.

Now accepting orders for the new 4 meg. chip/SIMM

CALL

1-602-220-0145

CIRCLE 218 ON READER SERVICE CARD

Used Systems

512K\$679.00
512Ke\$889.00
MacPlus\$1179.00
Mac SE\$2050.00

New Systems

MacPlus
Mac SE
SE/30
Mac II
Mac IIx

Hardware & Accessories

CMS 20 to 300 MB
800K Drive (int. & ext.)
12 & 2400 bps. Modems
Apple Laser & Dot Matrix Printers
GCC Laser Printers
Generic Dot Matrix Printers
While you wait service for local customers. Same day turn around for non-local customers.

Macintosh Repairs

Logic /Power Boards
Internal Disk Drives
Kbd repairs

Ram/Rom Upgrades

128K ---> 512K
128K ---> MacPlus
128K ---> 2MB MacPlus
512K ---> MacPlus
512Ke ---> MacPlus

Simmons

Consulting

CIRCLE 221 ON READER SERVICE CARD

(215) 352-6883
Ext. 20

Macintosh System Enhancements
6417 Market Street
Upper Merion, PA 19082

MEMORY UPGRADES

All you need to know about
memory upgrades.

1-800-950-CARE

in MN (612) 920-CARE

Call and we'll cut through the murk of memory for you. We know what we are talking about and we like talking about it. Memory upgrades from 1 meg to 8 megs for all Mac Systems. Use your fingers, your mind will follow. Enlightenment is but a phone call away.



(612) 920-2273
(612) 925-2720 (fax)
(800) 950-2273

5124 Russell Avenue South, Minneapolis, MN 55410
Dealer inquiries welcome. Visa/MC accepted.

CIRCLE 222 ON READER SERVICE CARD

NETWORKING

PhoneNET® System

The PhoneNET System is a network solution that includes a complete line of hardware and software products to help you build your networks, manage them, and use them to their full potential. Components include PhoneNET Connectors, the PhoneNET Repeater, the PhoneNET StarController™ with StarCommand™ software, TrafficWatch™, PhoneNET Check-Net™, Timbuktu™ and Timbuktu/Remote™, and ScreenRecorder™.

FARALLON COMPUTING
2201 Dwight Way
Berkeley, CA 94704
(415)849-2331

MacUser
Marketplace

To place your ad
Call (212) 503-5115 or
(800) 825-4ADS

PERIPHERALS

HARD DRIVES

LIFETIME WARRANTY

20 MEG INTERNAL	\$299	CALL
31 + MEG INTERNAL	\$369	ON
40 + MEG INTERNAL	\$505	CURRENT
46 MEG INTERNAL	\$419	LOW
50 MEG INTERNAL	\$600	PRICE
80 + MEG INTERNAL	\$840	
20 MEG EXTERNAL	\$426	
31 MEG EXTERNAL	\$479	
41 MEG EXTERNAL	\$547	WILL
40 + MEG EXTERNAL	\$590	MATCH ANY
45 MEG EXTERNAL	\$526	OTHER
61 MEG EXTERNAL	\$585	PRICE
80 MEG EXTERNAL	\$705	ADVERTISED
80 + MEG EXTERNAL	\$919	
100 MEG EXTERNAL	\$1020	

Fits in SE + Mac II with 2 drives
Include PD + Backup Software
External fits under Mac
Seagate—Miniscribe—Quantum
WESTCOM COMPUTER
P.O. Box 154-Ayden, NC 28513

800-422-8591-919-746-4961

CIRCLE 223 ON READER SERVICE CARD

PRINTERS

APPLE DAISYWHEEL PRINTER

Crisp office typewriter print quality on all MAC's & Apple II's. Fast 40 char/sec speed on 6-part forms. Fixed & proportional spaced fonts incl. legal & foreign language signs on one wheel. Boldface, 198 columns. NEW \$449. RECOND \$349 includes easy MAC point-&-click printer resource & cable. Auto sheetfeeder \$49. Commercial grade with 90-day guarantee. Quality Discount Computers, Inc.
135 Artist View Drive
Wellington, NV 89444
(702)465-2473 (415)487-8148

The Lowest Prices On
External SCSI
Hard Disk Drives

MiniScribe
20Meg \$389

1 Year
Warranty

Seagate
30Meg \$439

•Complete With
Cables, Manual

•LED Busy Light

•Fully Tested,
24-Hour Burn-In

30-DAY
MONEY BACK
GUARANTEE

Quantum
High Speed 19ms Access
(12ms With 64K Cache)

40Meg \$599

80Meg \$899

100Meg \$999

Software Selectable SCSI ID

2 Year Warranty

•Zero Footprint
Metal Case

•Twin SCSI Ports

•Formatter With
True Partitioning

DRIVE
KITS
AVAILABLE



800-622-3384

10606 BALTIMORE AVENUE, BELTSVILLE, MD 20705
SHIPPING EXTRA. MARYLAND SALES, ADD 5% TAX.

VISA OR
MASTERCARD
NO SURCHARGE

CIRCLE 224 ON READER SERVICE CARD

SCANNERS

SHARP COLOR SCANNERS

JX-300 & JX-450 for Mac, AT & PS2
Tel: (818) 882-7034 • Fax: (818) 341-3017



ALLIED INTERNATIONAL PURCHASING
Corporate Accounts Welcome

CIRCLE 225 ON READER SERVICE CARD

HWH Microsystems
Hammond, Louisiana

800-673-0586

• CALL FOR FREE CATALOG •

Zoom 2400 baud
Mac Modem \$119
with Mac software & cable

Samsung 15"
Full Page Monitor \$775
with card for SE or II

Seagate external
60 MB Hard Drive \$645
with cables; formatted & tested

9600 b. fax & data modem
Orchid MacFax \$495
with cable & BackFax S/W

M/C, VISA, shipping free

CIRCLE 226 ON READER SERVICE CARD

SECURITY

Mac Lock/Mac Cables

Mac Lock, finest security kit for Mac/ +, Se, Mac II, secures Mac, keyboard, mouse, 2nd drive, modem, & printer. Attractive red vinyl-covered steel 3/16" cables. Lock included. No tools req. \$-back guarantee. Also, all IBM, Apple II, \$49.95. Mac Cables provide any length custom cables for any computer need.

MAC PRODUCTS
20231 San Gabriel Valley Dr.
Walnut, CA 91789
(714) 595-4838

MacUser MARKETPLACE

USED EQUIPMENT

Call 800-541-2318

We Buy Macs

We buy & sell • One computer or a whole office • Talk to us before you buy!
Box 680, Watfield, VT 05673

Strictly Macintosh
Simply the Best

Maya Computer

CIRCLE 227 ON READER SERVICE CARD

SOFTWARE ACCOUNTING

P.O.S.

m a c

MINDING YOUR OWN BUSINESS

A highly efficient automated point of sale system. It's easy to learn, it's easy to use, and it runs single or multi-user. Supports a cash drawer, bar-code reader, & receipt printer. The best business investment decision you'll make this year!

CALL TODAY for free brochure Demo Available (717) 910-2912, 2415

POINT • OF • SALE • SYSTEM

INVENTORY & SALES CONTROL
INVOICING • PRICE QUOTATION
ACCOUNTS RECEIVABLE
EXTENSIVE REPORTING FUNCTIONS

CIRCLE 228 ON READER SERVICE CARD

To place your ad call
(212) 503-5115
or (800) 825-4ADS

BUSINESS

Mail Order Manager

SuperMOM is a turnkey database solution for catalog, direct marketing businesses. Order entry, accounts receivable, inventory, report generator, list management, UPS, multiple ship-to, group pricing, multi-user. Thorough tracking of marketing, inquiries, promotional response and sales. Demo avail.

National Tele-Press
P.O. Box 79
Mendocino, CA 95460
(707) 937-2848

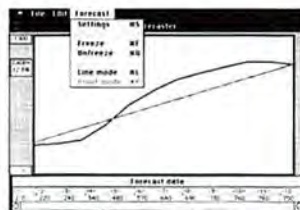
BUSINESS

Set a Trend by Drawing a Trend

Draw your forecast line and Tim Berry's **Forecaster** instantly shows the numbers. *MacWeek* says it "stands an industry trend on its head."

It's faster and better than most other methods, because most of us intuitively understand graphs better than numbers.

Forecaster rounds numbers, displays growth rates automatically. Can display past data while you do your projections.



Pastes numbers into Excel™, Works™, Full Impact™, MacCalc™, almost any Macintosh spreadsheet!

**Only 69.95.
(800) 336-5544**

In CA:(415) 325-3190
FAX:(415) 325-1250



Palo Alto
Software

260 Sheridan Ave, Suite 219
Palo Alto, CA 94306

CIRCLE 231 ON READER SERVICE CARD

BAR CODE

BAR CODE

FONTS FOR THE MACINTOSH

Print bar codes directly from your Macintosh programs when you add **PrintBar** fonts to your System

Use **UPC** Postscript fonts with LaserWriter and high-resolution printers such as Linotronic L-100, L-200, and L-300.

Print **Code 39** bar code fonts on ImageWriter or LaserWriter.

Use **PrintBar** with data base managers, label, page layout, and draw programs. Print bar codes as easily as you print text!

COMPLETE LINE MAC-COMPATIBLE BAR CODE READERS
FREE BROCHURES (916) 622-4640 / FAX 916 622-4775

Bear Rock

6069 Enterprise Drive, Diamond Springs, CA 95619

CIRCLE 229 ON READER SERVICE CARD

ORGANIZER+

Manage your:

- Clients & Contacts
- Phone logs
- Appointments
- To Do lists
- Projects
- Notes
- Documents

Features include:

- Full Import & Export
- Print Calendars
- Labels & Envelopes
- Form letters
- Contact history
- Links between files, clients, & calendar.

only \$79.95 plus s/h

VISA & MasterCard accepted

Dazzl 2 Chandler Court Columbia, MO 65201

314-874-8657

CIRCLE 232 ON READER SERVICE CARD

FLOWer

FLOWCHART DRAWING TOOL

\$39.95 PLUS \$3.00 SHIP&HANDLING
Texas residents add 8% sales tax
Check or M.O.

Send \$5 for 800K Demo Disk

Requires MAC 512E, +, SE, or II

- Standard Flowchart Symbols
- Custom Symbols can be added from clipboard
- Automatic Line Rerouting
- Offpage link to other charts
- Automatic Text Entry

Is it important?
Yes
No

Do what is necessary

Exit Function

**7713 SHADOW HILL LANE
HOUSTON, TEXAS 77072
(713) 550-0542**

CIRCLE 233 ON READER SERVICE CARD

MacResumé™

Professional Resumé Templates

50 professionally designed, formatted resumé templates for perfect resumé production every time!

In Microsoft® WORD or Works please specify



\$59

MacResumé™

PO Box 713

Cambridge, MA 02140

MA residents add 5% Outside US add \$3

1-800-422-9010 ext. 4091

CIRCLE 234 ON READER SERVICE CARD

Excel Templates

- **Business Management 2.1** \$39.95
20 templates for planning & operations.
- **Financial Decisions 2.2** \$49.95
31 calculator templates & loan amort.
- **Invoices, PO's, and Inventory 2.2**
Integrated, macro-driven. \$49.95
- **Personal Affairs 2.1** \$39.95
13 for finances, investments, etc.
- **All 4 plus bonus package** \$129.95

Money back guarantee.

Terrific values! Send for more info.

HeadStart Software

P.O. Box 51596 • Durham, NC 27717

VISA/MC, call 919/556-8792

CIRCLE 235 ON READER SERVICE CARD

BUSINESS

RMS Plus™ Restaurant Management System

Inventory Control
Menu Management
Purchase Order
Accounts Payable
Accounts Receivable
Restaurant Payroll
General Ledger

30-Day Money-Back Guarantee

Sextant Corporation
3516 27th Parkway
Sarasota, FL 34235
(800) 262-6665

CIRCLE 230 ON READER SERVICE CARD

BUSINESS

Business Power Tools™

BizPlan Builder™

Proven business & marketing plan template for raising capital, or launching new products or services. 90+ pages of outlines, headlines, structured texts, linked financial projections... typed & formatted into 33 MacWrite, Word & Excel. Sales & marketing oriented—fill in the blanks & edit into a complete plan. Successful with bankers, investors & corporate executives. Excellent for all managers. \$99.00

"We applied for a loan in early Nov. and by Christmas we had \$4,200,000."
— D.S., Lakewood, NY

"It's excellent—just the thing we need. It's saving us about 90% of the work."
— A. Armstrong

Grow faster, build profits, save time/\$\$
415/ 941-9191 • 800/ 442-7373

CIRCLE 236 ON READER SERVICE CARD

"My CPA highly recommends it."
— J.S., Fort Worth, TX

Production & Equalizer™

A large spreadsheet model to structure, modify, evaluate & balance the financial impact of sales forecasts for a variety of mfg./svc. conditions. Excel (SYLK) \$149

Companion software packages:

DealMaker™ Business Valuation Model
Combines several valuation methods for analysis of closely held businesses. Incl. report writer, manual. Excel (SYLK) \$595

Sales Quota Mgmt for mgrs & reps \$149

Pvt. Placement Memorandum \$149

LTD Partnership Agreement \$149

Employee Policies Handbook \$99

9 Manufacturing Worksheets \$99

JIAN/Tools For Sales™ Visa-MC-Amex

127 Second St., Los Altos, CA 94022

EDUCATIONAL

TEACHER'S ROLLBOOK

A complete classroom management tool • Grade averaging and reporting • New quick grade entry • Full attendance records and totals • Records disciplinary actions • Class size reports • Up to 315 students/file • Checked out items • Letters to parents • Requires Mac 512E, 2 Drives • \$99 • Demo \$10
Current Class Productions
22824 Berendo Avenue
Torrance, CA 90502
(213) 326-4246

THE COURSE BUILDER SERIES

Now in 3rd release and in color! Visual authoring languages that allow you to create stand-alone courseware for teaching, training and testing. Powerful built-in features include drawing, painting, animation, voice, music, grading, intelligent branching and video interface. \$10 demo disks available.

TELEBOTIC INTERNATIONAL, INC.

8410 Oak Ridge Highway
Knoxville, TN 37931
(615) 690-5600

ScreenShare

ScreenShare is software which enables an instructor to do demonstrations in a classroom of networked Macintoshes. ScreenShare broadcasts the contents of an instructor's screen to the screens of the students' Macs while suspending the students' work. ScreenShare for a classroom is \$249 (\$295 Canada)
White Knight Software Corp.
P.O. Box 564-810 West Broadway
Vancouver, B.C. Canada V5Z 4C9

MacUser Marketplace

Second Color Option Available

EDUCATIONAL

What Is Wrong with Me?

A teaching medical diagnostic tool for all ages



- Starting with the main complaint, each succeeding question narrows the differential until a reasonable diagnosis is reached.
- Over 1000 symptoms and findings and 500 diseases illustrated with over 250 pictures.
- Mirrors a physician's diagnostic talents utilizing techniques of artificial intelligence, fuzzy logic, hypertext, expert systems and probability theory.
- Richly interactive and intelligently linked to provide information about the diseases and the symptoms and findings related to the diseases.
- Fastest way possible to learn about diseases and all their manifestations.

Introductory Offer

Only \$100.00 (shipping and tax included), Free Factsheet.

ComputerMed 7777 Fay Avenue, Suite K-265
La Jolla, CA 92037 (619) 454-3755

CIRCLE 238 ON READER SERVICE CARD

EMULATION

II in a Mac

An Apple IIe computer
...all in software!

Run Apple II software on your Macintosh.

Convert Apple II files to Macintosh files.

\$149.95 Add \$3 for P&H

COMPUTER:applications, Inc.
12813 Lindley Drive Raleigh, NC 27614
(919) 846-1411

CIRCLE 239 ON READER SERVICE CARD

ENGINEERING

Professional CAD Symbol Library

Over 2,700 Symbols in One All-Inclusive Package

For All of Your CAD Needs:

Mechanical Electronics
Architectural Hardware
General Drawing Aids

And Much More, All for \$119.95!

Compatible with ClarisCAD™ and MacDraw II™

(303) 674-2222 to Order

(Specify ClarisCAD or MacDraw II Version)

Advanced System Design, Inc.

1010 Stagecoach Blvd., P.O. Box 3131

Evergreen, Colorado 80439

CIRCLE 241 ON READER SERVICE CARD

ENGINEERING

DesignWorks™

Professional, fully integrated schematic and simulation on the Macintosh, featuring:

- fully interactive digital simulation with logic-analyzer style timing display
- customizable net and component lists for interface with PCB layout and other systems
- 7400, 4000, 10K, LSI and analog libraries
- advanced editing features including bussing, symbol rotations, device and line dragging, Cut/Copy/Paste, multi-page drawings
- dot-matrix, laser printer, pen plotter output
- user-definable devices, RAMs, PROMs and PLAs with full simulation

LPLC™

Now you can use the Macintosh to develop and test circuit designs using Programmable Logic Devices. Full support for devices from MMI, AMD, Signetics, Lattice and others. High-level language constructs support Boolean equations, state machine entry, integer fields, etc. Full simulation support when used with DesignWorks.

DesignWorks: \$685 LPLC: \$535
Low-cost educational versions also available

Capilano Computing
545-108th St., Suite 6
Bellevue WA 98004
(604) 669-6343

CIRCLE 240 ON READER SERVICE CARD

STRUCTURAL-SURVEYING



NEW VERSION!! LANDesign... for surveying & land & road layout.

- Import/Export data, radial stakeout, log, slideshows
- All information is displayed graphically at all times
- Points, lines, curves, boundaries and traverses can be added, changed, copied, pasted and duplicated
- FRAME mac, BEAM mac 2 BEAM mac for structural analysis of 2 D frames, trusses, and beams
- MacShapes for calculating structural properties

All programs have full Macintosh interfaces. Money back guarantee, free support. From \$145-\$595. Visa or MC.

Computing Inc. - (416) 738-4601

113 McCabe Crescent

Thornhill, Ontario L4J 2S6 CANADA

CIRCLE 242 ON READER SERVICE CARD

MacUser Marketplace

To place your ad
Call (212) 503-5115 or
(800) 825-4ADS

ENTERTAINMENT/GAMES

McHOROSCOPE
Be your own astrologer, for fun or profit.
Produce amazing astrological reports for friends and family. **\$199.50**

"McHoroscope" (Chart Interpreter) produces beautiful natal charts plus 15- to 17-page interpretations. Professional astrologers charge \$50.00 and more for similar reports. Excellent study guide for students and great fun for parties and get-togethers.

• Astrology for the Macintosh from Time Cycles Research •
• Write or call for free brochure •

Time Cycles Research 27 Dimmock Rd Waterford, CT 06385
MC-Visa-Amex
(203) 444-6641
CIRCLE 243 ON READER SERVICE CARD

Prepare to meet your NEMESIS™
Go has been a way of life in the Orient for over 4,000 years. As much a philosophy as it is a game, many think Go is the secret of Japanese success in the world market. "While chess is a game of war, Go is a game of market share." (Pres. Nikko Hotels)

Authorized by the "Father of Computer Go", NEMESIS™ Go Master™ is an ideal opponent. By far the best, NEMESIS is the only program rated in human tournaments. "Fantastic!", "a great product", "a good way to learn Go" say our enthused users.

\$79 Go Master + \$6 S&H The only Go program to successfully imitate human play.
Toyogo, Inc. 76 Bedford Street, Suite 34-U, Lexington, MA 02173 (617) 861-0488

CIRCLE 244 ON READER SERVICE CARD

SPORTS HANDICAPPING SW
\$\$\$WIN with horse racing & greyhound handicapping software-\$32.95, \$52.95, \$67.95, \$77.95 each. Up to 17 entries analyzed: class, speed, times, odds, track, post, stretch, & finish. Pro Football, Baseball, Basketball Software-\$52.95. Handicap races & games in minutes. MC/VISA accepted. Free info. SOFTWARE EXCHANGE
P.O. Box 5382-MU
W. Bloomfield, MI 48033
(313) 626-7208. Orders: 1-800-527-9467

FINANCIAL

The Right Time System
The Stock, Index & Futures programs generate accurate Buy/Sell signals for individual stocks, indexes and commodities. The software was developed by an expert portfolio manager for his own personal use & are now available for any smart trader who wants to make quick profits. Call or write for free info.
T.B.S.P. Inc.
620 Avocado Ave.
Corona Del Mar, CA 92625
(714) 548-2874

FONTS

18 POSTSCRIPT FONTS FOR \$63

ArchIText® GENDARME™ PALOMAR™ Konway™ and others... FontSet 1-18 fonts for \$63. FontSet 2-18 fonts for \$63.

Orders or samples call (312) 441-6699
or write EmDash, P.O. Box 8256, Northfield, IL 60093
CIRCLE 246 ON READER SERVICE CARD

EmDash™

FONTS

ABCabc

1. 18+ "Sans A: Similar to Futura® Ultra Bold Cond.

ABCabc

2. 18+ "Sans B: Similar to Clearface® Gothic.

ABCabc

3. 18+ "Sans C: Similar to Compacta®.

ABC

4. 18+ "Serif A: Similar to Bauer Text Initials.

ABCabc

5. 18+ "Serif B: Similar to Plantin® Old Style.

Laser display type for the Macintosh computer. 18, 24, 36, 48, 60, 72, 84, 96 and 120 point. Extensive kerning pairs based on large type usage. \$65 each. 312.980.0887

18+ FONTS™

337 White Hall Terrace, Bloomingdale, IL 60108
FAX 312. 980.0942
VISA / Mastercard

© 1988 18+ Fonts™ All rights reserved. 18+™ is a trademark of 18+ Fonts™. All other trademarks and registered names are the property of their respective owners.

CIRCLE 247 ON READER SERVICE CARD



GIAMPA TEXTWARE CORP

publisher of the Lanston Monotype Type Library



Albertain™
SMALL CAPITALS
Albertain Italic
\$165.00

LTC Goudy Thirty™
\$65.00

LTC HADRIANO™
\$65.00

LTC Jenson™
\$65.00

Kaatskill™
SMALL CAPITALS
Kaatskill Italic
\$165.00

LTC Swing Bold™
\$65.00

LTC is a trademark of Lanston Type Co
PostScript - Macintosh

1340 EAST PENDER STREET
CITY OF VANCOUVER
PROVINCE OF BRITISH COLUMBIA
DOMINION OF CANADA V5L 1V8

(604) 253-0815 FAX: (604) 255-2601

CIRCLE 248 ON READER SERVICE CARD

Beverly Hills

"Best Imagewriter™ font available!"

- "Typeset" look, 11 sizes, 6-36 pts.
- Multi-digit fractions; horiz. lines
- Fine spacing, math/musical symbols
- Includes disc, 70-p. printed manual
- Two compatible versions available:
 - v 2.0 (ImageWriter I or II): \$29.95
 - v 1.0 (IW LQ, Mac +): \$39.95
- Direct orders, add \$3.00 S/H (plus \$1.80 or \$2.40 sales tax in Calif.)
- Site licenses; dealer inquiries invited

ADH Software
P.O. Box 67129
Los Angeles, CA 90067-0129

CIRCLE 249 ON READER SERVICE CARD

FONTagenix™

4 volumes of dot-matrix display and text fonts
ARTagenix™ Collection of graphics
LASERgenix™ Cyrillic, ipa, others
6 Downloadable Laser fonts \$39.50 ea.

FOREIGN FONTS EDITION™

22 foreign language fonts on one disc \$69.50

Customized Fonts & Logos Available
All Orders add \$3 s/h, CA res. add 6% tax
(714) 621-0973 **DISCA**

Devonian International Software Company
P.O. Box 2351
Montclair, CA 91763
CIRCLE 250 ON READER SERVICE CARD

GENEALOGY

MacGene™ (version 3.1)

"Genealogy for the Rest of Us..."
Easy for the beginner, Extras for the expert. Combines data-entry, search, report, chart. Custom notes, lists, pedigree, family trees, biography, in/export, auto-linkage/generation, publish ready, plus more... the FASTEST...\$-back guarantee \$145. Demo \$25.
Applied Ideas, Inc.
PO Box 3225
Manhattan Beach, CA 90266
Free info: (213) 545-2996

MacUser MARKETPLACE

GENEALOGY

HYPERGENE

A genealogy program to store your complete family history. Includes charts, info sheets and will receive scanned-in photos to print your family album. Ancestors and descendants can be viewed or printed in a tree format from the point of view of any subject. For more info call: CompServCo
1921 Corporate Square
Slidell, LA 70458
(800) 272-5533

GRAPHICS

DiagramMaker™

Gives you versatile and easy to use graphics and text tools for producing structured drawings for just \$125

Typical Applications:

- Top Down System Design
- Presentation Graphics
- Organization Charts
- Technical Documentation
- Desktop Publishing

Special Features:

- Editable Palette
- Text Associated with Objects
- Connected Objects Stay Connected
- Object Linking
- Background & Foreground Drawing

To order or for further information:

Phone (919) 942-1111, or write to us:
ACTION SOFTWARE
1507 E. Franklin St., Suite 122, Chapel Hill, NC 27514
CIRCLE 251 ON READER SERVICE CARD

Clip Art Maps!

- World
- Continents
- USA
- All 50 states by county!

- Paint
- Draw
- EPSF

From \$79

Ideal for publications & presentations.
For FREE brochure call or write:

800-334-4291

MicroMaps Software, Inc., Box 757, Lombard, IL 06530

CIRCLE 252 ON READER SERVICE CARD

MacUser Marketplace
is a special
economical
section for
product and
service listings.

GRAPHICS

Professional Macintosh Graphics Systems 1989 Eddy Winner

featuring the TRUEVISION® NuVista series Graphics Controllers

Capture and display full screen 32-bit images • Broadcast quality, genlock, and sync generation
Programmable display resolution & scan frequency • Output to video • NTSC and PAL compatible
Complete professional 32-bit graphics systems available including hardware, software and support

For more information, call or write: Videographics Corporation
211 East Ohio Street, Suite 1909, Chicago, Illinois 60611
Phone: (312) 871-3625

CIRCLE 253 ON READER SERVICE CARD

LightMagic™

- Create flicker free movies on your Mac by moving LightMagic™ graphic objects on the screen with mouse!
- Grab artwork from any program!
- Play movies (a up to 60 frames/second!
- Use 2, 4, 16, or 256 colors per movie!
- Play multiple movies at once!
- Play LightMagic™ movies on top of any HyperCard™ stack with the LightMagic™ HyperCard™ Driver!

LightMagic™ and ArtSketch™ B/A
Only \$199.00

LightMagic™ HyperCard™ Driver
Only \$99.00

Mac Plus™, Mac SE™, Mac II™ • 1 MB RAM & 128K ROMs req. (Add \$3 for s/h, CA+9)

Software Sensations (Dealers Wanted)
P.O. Box 2240 (Check or M.O.)
San Anselmo, CA, 94960 (415) 453-5734

CIRCLE 254 ON READER SERVICE CARD

MAC INTERIORS

Mac Interiors is an easy to use 3D software package for space planning of offices, factories, schools, or homes. It creates a 3D room layout which may be viewed and printed in plan, elevation and perspective. It allows you to design your own library of 3D objects.

CompServCo
1921 Corporate Square
Slidell, LA 70458
(800) 272-5533

MAC-ART LIBRARY

Illustrate your ideas with the MAC-ART LIBRARY! Twelve disks of professional MacPaint images: • Transportation • Flowers/Plants • Symbols/Borders • Greeting Cards • Farm Life • Geography • Buildings • Animals • Sports • Kitchen • People • Tools \$39.95/disk. \$250/set. \$49.95/sampler. \$3.00/s/h

CompuGRAF
P.O. Box 3155
Englewood, CO 80155
(303) 791-2077

MacPLOT MacCAD

MacPlot by Microspot is the "chooser" level plotter driver of choice. It will plot any object oriented graphics produced on the Mac using "print" command. It supports over 50 plotters. MacCad is a series of 12 separate architectural & engineering template symbol libraries for use with MacDraw, MacDraft, MiniCAD, etc.

COMPERSVCO
800 Freedom Lane
Slidell, LA 70458
(800) 272-5533 or (504) 649-0484

LANGUAGE TOOLS

Cross Assemblers

µASM™

- 400 COP400 family
- 1802 1802 family
- 6502 6502/C6502
- 6801 6801/6801P/301 families
- 6804 6804/HC04
- 6805 6805/HC05/6305
- 6809 6809/6309
- HC11 HC11/6800/6801 families
- 8048 8048 family
- 8051 8051 family
- 8085 8085/8080 family
- 8096 8096/80C196 family
- Z8 Z8 family
- Z80 Z80/64180 family

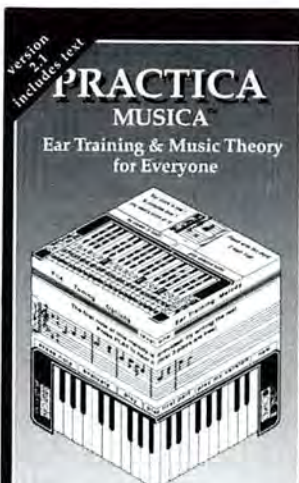
Fast. Full Macintosh interface. Output downloads to most EPROM programmers. Features macros, conditional assy, local and automatic labels, symbol table cross-ref, module sectioning. Editor included. MC/V.

Micro Dialects, Inc. Dept U
PO Box 30014
Cincinnati, OH 45230
(513) 271-9100
MC/V and MICRODIALECTS

\$4 cont. USA, PO Box 30014
\$8.50 Can, AK, HI Cincinnati, OH 45230
\$15 overseas (513) 271-9100

CIRCLE 255 ON READER SERVICE CARD

MUSIC/MIDI



"Best New Education Program, 1987"
-MacUser Magazine

- Teaches intervals, chords, melody, rhythm
- Interactive staff notation • Saves scores
- High quality sound • MIDI compatible
- Historical & computer-generated melodies
- Custom ear training melodies

\$125 • Call Toll Free 800-445-4866,
In CA: 800-445-8749

ARS NOVA

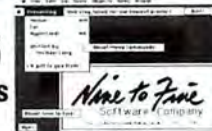
BOX 40629, SANTA BARBARA, CA 93140

CIRCLE 256 ON READER SERVICE CARD

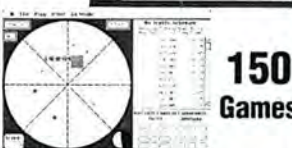
PUBLIC DOMAIN

ECONO PAKS

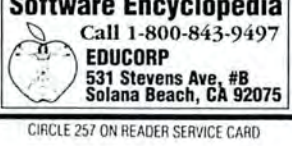
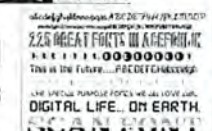
125
Stacks



125
Kids



150
Fonts



CIRCLE 257 ON READER SERVICE CARD

CIRCLE 257 ON READER SERVICE CARD

MacUser MARKETPLACE

PUBLIC DOMAIN

FREE PUBLIC DOMAIN & SHAREWARE CATALOG

- ✓ Lowest Price
- ✓ Best Quality
- ✓ Fast Service

Over 1000 Macintosh
Software

Write to:

SOFTSHOPPE
2848 Briar Cliff Rd.
Ann Arbor, MI 48105
(313) 761-7638

CIRCLE 258 ON READER SERVICE CARD

PUBLIC DOMAIN/SHAREWARE SPECIAL INTRODUCTORY PACK!

- 100 Games • 100 Desk Accessories
- 100 Fonts • 18 Business Applications
- 318 Programs on 7-800k disks.

All 318 programs for \$27.95 + \$3.00 s/h COD,
AMEX & Check Accepted. Catalogue \$2.00. Any
of our 800k full disks—3 for \$13.00.

DoMain Chain
P.O. Box 366
Bronte, TX 76933
(915) 473-3291

You Pick It!

Tired of getting what they want to send you?
Choose an 800k disk of what YOU want from
our library of over 300 meg of high quality
shareware & public domain software, graphics,
games, DA's, fonts, utilities & stacks. ONLY
\$15. Prices reduce for multiple disks. Send \$5
(refundable) for a catalog.

HK Distribution
P.O. Box 201432
Austin, TX 78720-1432
(512) 331-8170

RELIGION

Bible Search Software *ThePerfectWORD™*

English Versions
KJV • NIV • RSV

Greek NT
Hebrew Bible
Demo Disk \$5



Star Software, Inc.
229 Live Oaks Blvd. #MU
Casselberry, FL 32707
(407) 831-8050

CIRCLE 259 ON READER SERVICE CARD

RELIGION

Bible study tools that grow with you.



THE WORD processor
The most comprehensive Family
of Products for Bible Study.

Start with **VERSE SEARCH**
including the Bible translation of
your choice with Instant Access
to any verse. Search for any
words or phrases. Separate
windows for comparing verses.
And much more! Only \$99.95

AS YOU GROW, add NIV, RSV,
KJV or NKJV text, Greek or Hebrew
transliterations or topical cross
references, personal commentary,
a chronological Bible and chain
references. Our memory resident

VERSE TYPIST transfers
verses to your word processor.

Bible Research Systems
1-800-423-1228

2013 Wells Branch Parkway #304 • Austin, Texas 78728
Tech Support (512)251-7541 Postage extra. For IBM, MSDOS, Macintosh.

CIRCLE 260 ON READER SERVICE CARD

SCIENTIFIC

typeset quality

Equations Made Easy

See 5 Mice Review in this
issue's MiniFinders
under Word Processing

Expressionist™ 2.0

2-Way T-X
Interface

$$B = \frac{\mu_0}{4\pi} \int \frac{J \times r}{r^2} dt$$

A powerful application and desk accessory that generates
equations for word processing and Desktop Publishing.

allan bonadio associates 814 Castro #51, SF, CA 94114, (415) 282-5864 **\$129.95**
CIRCLE 261 ON READER SERVICE CARD

STACKWARE

Learn German French Russian a FUN way!

MacFlash™ Cards are vocabulary stacks that YOU
customize for YOUR study habits. Over 2000 base
words & 1000 more synonyms. English translation
includes multiple meanings. Practice noun gender.
Russian has accents. German I & II, French I, &
Russian I are \$25 each. S & H \$3, CA Res add 7%
tax. Call 8 AM-8PM PDT or send check or MO to
The Language Quest Software Co.
101 First Street, Suite 428, Los Altos, CA 94022
Orders only: 1-800-283-4080 X850

CIRCLE 262 ON READER SERVICE CARD

STACKWARE

Изучайте языки!

Russian, German, French,
Spanish, and Japanese
Stackware. Many with digitized
sound. \$29.95 - \$49.95.

Pronunciation, verb, noun, and
vocabulary tutors. Call or write
for our catalog. MC, Visa,
COD. School P.O.'s. Requires
HyperCard 1.2.x.

The HyperGlot Software Co
505 Forest Hills, Knoxville,
TN 37919 (800)726-5087
CIRCLE 263 ON READER SERVICE CARD



**CANADIAN
FACTS
STACKS**

Getting the facts on Canada just got easier. If you
ever wanted quick access to information on the key
facts, statistics, geography, history, artists, important
people, sports, the provinces, the prime ministers, and
the political system that make Canada a great nation
then you owe it to yourself to pick up your copy of *Canadian Facts Stacks Version 1.0* for Apple's Hyper-
Card™. Canadian Facts Stacks is valuable tool for busi-
ness, institutions, educators, students, libraries or
individuals looking for quick "finger-tip" access to in-
formation on Canada.

Price: \$59.95 available by direct mail order only.
VISA, MasterCard, cheques and money orders
accepted.

For your copy contact:
Canadian Facts Stacks, Bag 800,
Vegreville, Alberta, Canada T0B 4L0.
CIRCLE 264 ON READER SERVICE CARD

MacRecorder® Sound System

When graphics and text are not enough, give
your presentations a more dramatic dimen-
sion—narration and sound. The MacRecorder
sound digitizer, SoundEdit™, HyperSound Tool
Kit and HyperSound™ software allows you to
record and play back live or pre-recorded sound
on your Macintosh. Combine with Apple's Hyper-
Card™ and Farallon's ScreenRecorder™
(available separately) to create new multi-media
platforms to train, educate, and communicate in
business.

Farallon Computing
2201 Dwight Way
Berkeley, CA 94704
(415)849-2331

CLIENT MEANS BUSINESS!

CLIENT™, user customizable client & sales
management system, maintains customers,
business & financial information, contact histo-
ry & more. Spec features: pop-up choice lists
for fields, redefine field names & formats,
search by any combination of fields, mail
labels. Incl latest HyperCard® \$195

Trendware Corporation
Box 2285
Huntington, CT 06484
(203)926-1116

MacUser Marketplace

Listings are grouped by category and sold by column inches.

MacUser MARKETPLACE

STACKWARE

HyperTools™ #1 includes: Icon Editor, Scan Cards, Alignment & Array Creation Tools, Script Cross Reference & Font Tools, XCMD tools, Button Tools and more. 16 Tools in all for stack design! \$99.95

HyperTools™ #2 includes: Multiple Choice Lists for Fields, Field Sorting, Formatting & Data Validation, Sound Tools, Group Tools, Font Tools and more. 16 tools for visual presentation of data! \$99.95

Stack Cleaner™, a utility set. Complete menu creation & editing facility for stacks including standard menu resources & hierarchical menus. A script cleaner to reduce the size of scripts by using standard abbreviations. Plus utilities to merge, split, and clone stacks. \$49.95

Trendware Corporation Box 2285 Huntington, CT 06484 (203)926-1116
CIRCLE 265 ON READER SERVICE CARD

Japanese Language Instruction

Learn the Hiragana and Katakana character sets using these HyperCard stacks. Exercises are given that benefit all students of Japanese. Character generation, Phonetic Pronunciation, Reading and Writing exercises. Word list size is 1600 for the two-program set. Cost is \$45. Send check or M.O. to:

ANONAE SOFTWARE
P.O. Box 7629
Berkeley, CA 94707
(415) 527-8006

STATISTICS

RATS Version 3.0

RATS is an integrated environment for data analysis, forecasting and graphics. Forecast with Box-Jenkins (ARIMA), exponential smoothing, vector autoregressions, large models and others. Choose from a wide variety of techniques to analyze your data, from stepwise regression to logit and probit, from two-stage least squares to spectral analysis. \$300.00

VAR Econometrics, Inc.
P.O. Box 1818
Evanston, IL 60204-1818
(312)864-8772; (800)822-8038

MISCELLANEOUS/ACCESSORIES

HEAVY DUTY MAC HARD CASES



HEAVY DUTY FOAM LINED CASES WITH COMPARTMENTS FOR KEYBOARD & MOUSE

1-800-882-7112 In MI 616-374-7105

WESTERN CONTAINER & CASE Box 125, Woodland, MI 48897

CIRCLE 266 ON READER SERVICE CARD

MC & VISA	AIR FREIGHT HARD CASE	HEAVY DUTY HARD CASE	SERIES 3 HARD CASE	SOFT SOLED FOAM LINED
MAC SE	\$240	\$195	\$156	\$79
MAC SE, EXT/KB	\$250	\$204	\$166	\$88
MAC PLUS	\$240	\$195	\$156	\$79
MAC PLUS EXT/KB	\$250	\$204	\$166	\$88

CASES ARE AVAILABLE FOR ANY COMPUTER. ALSO, CUSTOM CASES

DUST COVERS



100% COTTON CANVAS

BEIGE WITH GREY TRIM

BREATHABLE! STATIC-FREE!

FOR

MAC, II, & PRINTERS

CALL TOLL-FREE

1-(800) 826-5761

Contemporary ComputerWear
1320 - 36th Ave. San Francisco 94122

CIRCLE 267 ON READER SERVICE CARD

Custom Printed Mouse Mats™

Price each with one-color imprint

12 mats	7.89	150 mats	3.90
25 mats	7.47	300 mats	3.60
50 mats	7.06	600 mats	3.44
100 mats	5.73	1200 mats	3.34

- Prices include shipping
- Grey or Red Mats - 8" x 9 1/2"
- Individual samples - 12.50 each
- Long-lasting imprints will not rub off
- Custom colors, multi-color printing available
- Delivery - Approx. 1-2 weeks.
- Rush service is also available.



1-800-782-8628

Peak Products, Inc.

12434 Cedar Road • Cleveland, Ohio 44106 • (216) 229-2578

CIRCLE 268 ON READER SERVICE CARD

ACCESSORIES

OZERO HALLIBURTON®

A 50 YEAR TRADITION



Mac Plus/SE



Mac IIcx Transport System

Case Closed

from \$299.95

THE BEST CASE SCENARIO

Airline Check-in or Local Use

ZERO HALLIBURTON Aluminum Macintosh® Cases:
Plus SE MacII Ix Mac Icx ImageWriter® II
Strength Durability Lightweight Distinctive Styling

1-800-327-1829

TLC

7345 Radford Street
N. Hollywood, CA 91605

CIRCLE 269 ON READER SERVICE CARD



Pack your Mac in seconds!

Cordura case has internal padded pockets for mouse, keyboard and drive. Available in six colors. Extended Keyboard version also available. for a dealer near you call toll free

1-800-548-0053

West Ridge Designs

1236 N.W. Flanders, Portland, OR 97209
CIRCLE 270 ON READER SERVICE CARD

CHECK YOUR MAC SHIP YOUR MAC

PERIPHERALS



SEMAC II

with TransMac™ ORBIT SYSTEMS

225 Third Street
BOWLING GREEN, KY 42102
502-782-0600
1-800-541-5421

Dealer Inquiries Welcome

CIRCLE 272 ON READER SERVICE CARD

AntiGlare Filters

Optical glass filters for: SE, 13" RGB, Radius FPD, TPD.

Carrying Cases

Cordura cases

Shipping cases

Call 1 800 851-1551

The Madson Line

295 Third St., Oakland, CA.

CIRCLE 271 ON READER SERVICE CARD

MOUSE PADS

Custom Printed or Plain Cloth in 13 Colors:

Size:	8 x 7 1/2	8 x 9 1/2	8 1/2 x 11
12	\$3.25	\$3.50	\$3.75
72	\$3.00	\$3.25	\$3.50
144	\$2.85	\$3.10	\$3.35

Fast Pad And View Pad:

12	\$6.50	36	\$6.00
72	\$5.75	144	\$5.00

PRECISION LINE INC.

14100 23rd Ave. N.

Plymouth, MN 55447

(800) 328-0077, (612) 557-1979

ACCESSORIES category
continued on next page . . .

MacUser MARKETPLACE

ACCESSORIES

THE FINEST MACINTOSH LUGGAGE AVAILABLE

The Finest Luggage available for the Macintosh anywhere at any price. Each bag comes with a comfortable professional shoulder carry strap, not a cheap, painful piece of plastic. Dividers and pockets on the inside with two additional pockets on the outside distinguish the MacBag from many "rag bags" on the market now. Available in assorted colors for SE, SE with extended keyboard, and Imagewriters. Also available with backpack straps.



We also manufacture freight cases for shipping or the frequent flyer. The only way to transport a Mac II or Laserwriter. The Best in Custom Cases.

Linebacker 643 Industry Drive, Seattle WA 98188
Call Us at 1-800-228-7042 or 1-206-575-1180

CIRCLE 273 ON READER SERVICE CARD

CATALOGS/ PUBLICATIONS

The Macintosh Exchange

Your monthly connection for buying or selling used Macintosh hardware, software, accessories, etc. Classified and display advertisements are available each issue. One-year (12 issues) subscriptions available for only \$24 includes 1 free 15 word classified. Current single issues \$3.00. Please call or write for ad rates:

The Macintosh Exchange
P.O. Box 71591-DEPT. MU
Reno, Nevada 89570-1591
(702) 852-2292

DATA CONVERSION SERVICES

**WE CAN CONVERT DATAFILES
TO/FROM OVER 1,500+ SYSTEMS
IN VIRTUALLY ANY FORMAT!
— ON DISKS OR TAPES!**

Systems like:

- Mainframes
- Minis
- Microcomputers
- Dedicated Word Processors
- Typesetters, etc.

Formats like:

- MacWrite*
- Microsoft Word*/Works*
- WordPerfect*
- Omnis*
- 4th Dimension*
- FileMaker*
- Jazz*
- Excel*
- Tab-delimited ASCII, etc.

*Trademarks of their respective companies

CompuData Translators, Inc.

3325 Wilshire Blvd. Ste. 1202
Los Angeles, CA 90010
800/825-8251 • 213/387-4477

CIRCLE 275 ON READER SERVICE CARD

TAPE/DISK CONVERSIONS

Conversion services for your Macintosh to over 2000 computer systems. Capabilities include converting to or from:

- * Magtapes *Mini & Micro Computers
- * Word Processors *Typesetters

Data can be supplied in over 250 software packages. OCR scanning also available. Pivar Computing Services, Inc. #MU
165 Arlington Heights Rd.
Buffalo Grove, IL 60089
(312)459-6010

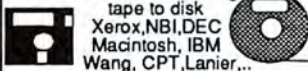
MacUser Marketplace

To place your ad call
(212) 503-5115
or (800) 825-4ADS

DATA CONVERSION

**Over 2500 formats
Quick turnaround**

all word processors, mini, micro, mainframe, databases/spreadsheets disk to disk, OCR Scanning tape to disk
Xerox, NBI, DEC
Macintosh, IBM
Wang, CPT, Lanier,...



National Data Conversion Inst.
5 east 16th street, new york, n.y. 10003

(212) 463-7511

CIRCLE 274 ON READER SERVICE CARD

DESKTOP PUBLISHING SERVICES

SLIDES!

ATTENTION USERS OF

- POWERPOINT 2.0
- PERSUASION
- STAND OUT!
- MORE II

DIGITAL PHOTO

WILL IMAGE ANY

PICT OR 24 BIT TIFF FILES.

24 HOUR MODEM

2 FREE SLIDES
WITH FIRST ORDER

CALL FOR INFORMATION:
402-393-1744 \$7

CIRCLE 276 ON READER SERVICE CARD

LASER SET™ TYPESETTING

THE LOWEST PRICES and high quality personalized service. L100 & VT4300P PostScript typesetting from disk or modem. 24 hr. service. Super volume discounts. (150 pages—\$3.50/page paper, \$5.25/page film) Professional type, design and consulting services.

LASER SET™

217 Dover Parkway
Stewart Manor, NY 11530
(800) 333-2581, (516) 354-2581



**TYPETRONICS
SERVICE BUREAU**

Macintosh / PC Output: Linotronic L-500

- Output up to 18" wide on paper positives or film negatives.
- Professional type, design, and consulting services.
- 24 hour service.

PHONE: (313) 364-3140
MODEM / FAX: (313) 364-3840
626 Busha Hwy. Marysville, MI 48040

CIRCLE 280 ON READER SERVICE CARD

DESKTOP PUBLISHING SERVICES

• MACINTOSH • SLIDE IMAGING

PROFESSIONAL 35mm SLIDES
DIRECT FROM YOUR DISK
OR VIA MODEM

FROM
\$650

NO ADDITIONAL SOFTWARE TO BUY!

- Aldus • Cricket
- MacDraw
- ReadySetShow • Canvas
- Power Point • and Many Others!

24 Hour Service.
Also available - Color Prints
Slide Dups - Overheads.

CALL FOR DETAILS:



Slidemasters
Dallas, Texas
(214) 437-0542

CIRCLE 277 ON READER SERVICE CARD

MAC SLIDE IMAGING

**\$5 / SLIDE
4 DAY
SERVICE**
• Shipping

- MacDraw II
- Power Point
- Persuasion
- More II

We Can
Image Any

- PICT
- Scrapbook
- PC HP GL

Custom Slides
Available

Only \$5

Mail your images
today to

GALAXY GRAPHICS

2928 Cambridge Drive
Woodbridge, Virginia 22192
703-278-8000

CIRCLE 278 ON READER SERVICE CARD

MacUser Marketplace

**Second Color
Option
Available**

MacUser MARKETPLACE

DESKTOP PUBLISHING SERVICES

VARITYPER PostScript OUTPUT

LOWEST prices, bulletin board or from disk, FAXED proofs, 12 years trade experience, \$6.37 first page, discounts begin on 2nd page (100+ pages \$3 ea. - film \$5.00 ea.). Scans & halftone reproduce excellently. No bump in price for graphics.

ENTERGRAPHICS™

RR1, 356A Salt Pt. Turnpike
Poughkeepsie, NY 12501

(914) 473-4108 / Modem 473-5719

MAILING LISTS

MAILING LIST of Mac Users



On labels, tapes,
Mac diskettes...
or by modem.



Choose from
hundreds of
thousands of users!



Only 5¢ per name, with no charge for selecting, sorting, media, or delivery.

Semaphore Corporation, 207 Granada Dr., Aptos, CA 95003

(408) 688-9200 (voice)

(408) 662-2717 (modem)

CIRCLE 283 ON READER SERVICE CARD

INSURANCE

SAFWARE INSURES

*Business Computers *Home Computers
*Overseas Computers *Leased Computers
*Computers Leased to Others *Computers
taken to Shows *Computers Held for Sale
*Others *Computers in Your Care Call for complete information!

SAFWARE, The Insurance Agency Inc.

2929 N. High St.

P.O. Box 02211

Columbus, OH 43202

(800) 848-3469 (NAT) or (614) 262-0559 (OH)

SERVICES



PCD & HDA REPAIR ON MOST APPLE MACINTOSH AND PC HARD DRIVES • 6 MONTH WARRANTY

SCSI Hard Drive Repair & Data Recovery

FACTORY TRAINED TECHNICIANS • CLASS 100 CLEAN ROOM • FULL DIAGNOSTIC TEST RESULTS

COMPUTER PERIPHERAL REPAIR

7570 S. U.S. HWY. 1, SUITE 8/9 HYPOLOXO, FL 33462 ~ (407) 586-0011

CIRCLE 281 ON READER SERVICE CARD

RECRUITMENT

Sales

Ad Sales

Ziff-Davis' leading Macintosh computer magazine located in the San Francisco Bay Area seeks experienced Account Representatives to join the ad sales team.

In this position you will work with outside field sales reps in handling a large number of varied accounts, assist to develop new business and prepare specialized presentations. At least 1 year of bus exp is required; media/sales and/or ad agency training and a college degree preferred.

Competitive base salary/lucrative commission plan and excellent benefits package. Submit resume with cover letter/salary requirements to: Ziff-Davis Publishing Co., Human Resources/LRMW, 362 Lakeside Drive, Foster City, CA 94404. EOE

MacUser
THE Macintosh RESOURCE

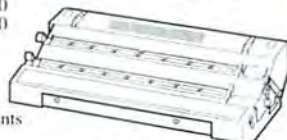
SUPPLIES

TONER-2 DAY AIR Prepaid Return

- Remanufacturing Services (your cartridge)
- Laser cartridges in Black \$44.50
- Laser cartridges in Colors \$64.50
- PC cartridges in Black \$39.50
- Microfiche/Fax cartridges \$44.50
- In stock rebuilt laser cartridges \$59.50

Get back your cartridge!
Every cartridge pretested!
Color test prints available!

- We support over 200 diff. printers! • Bulk
- New Cartridges from \$89.50 • Qty. discounts
- We buy empties in large quantities, call.



100% Satisfaction

24 Hours

800-777-8444

LASER Quip

9723 Mill Creek Drive
Eden Prairie MN 55444

•Franchises
•Wholesale

CIRCLE 285 ON READER SERVICE CARD

reconditioned TONER cartridges!



BETTER THAN NEW!
• 20% MORE TONER
• DARKER PRINT
• 100% GUARANTEED

Willow Products Corp.
3857 Willow Ave. Pgh, PA 15234

for laser printers & Canon PC Copiers
From \$44.95

We buy empties
call for brochure
800-426-8196



CIRCLE 286 ON READER SERVICE CARD

Boldest Darkest + Sharpest Black Lightning Inc.

It all adds up to Quality

Toner Cartridges

Do business with technological leaders and save money. Or you can buy them reconditioned from inventory. We also buy used cartridges. Prepayment, Master Card, Visa, and PO's.

1-800-BLACK99

Fully Tested & Guaranteed

CIRCLE 287 ON READER SERVICE CARD

Get your Cartridges in Shape!

Full Service Recharging of All Makes of Laser Printers and P.C. Toner Cartridges.

- ★ 100% Remanufactured Including Recoated Drum
- ★ 24 Hr Turnaround
- ★ 100% Guaranteed
- ★ Freight Paid

UTC Certified

only \$44.50

H&S Research

9454 E. Watson Dr.

Tucson, AZ 85730

1-800-289-0308

CIRCLE 288 ON READER SERVICE CARD

DISCOVER HOW TO SAVE 30%-50% ON TONER CARTRIDGES.

\$395* Copiers \$450* Printers

- 100% Unconditionally Guaranteed
- Laser Cartridge Recharging Compatible with:
- Printers: HP Series 1 & II, Apple, Canon, QMS, NEC...
- Copiers: Canon PC models 10, 14, 20 & 25

Dealerships & Training Available

Send empty Cartridges & Felt Cleaner

in original container to:

LASERTECH

27403 E. Hwy. 4

Farmington, CA 95230

Phone (209) 886-5440

*Add Sales Tax for CA

CIRCLE 289 ON READER SERVICE CARD

LASEREDGE® Paper/Film

Get high resolution from plain paper laser printers, and color plotters. LASEREDGE® high resolution Paper/Films are waxable for paste-up. The bright white background, denser image, and finer edge of line will allow enhanced capability for 300 dpi to reproduce on camera. Call or write for samples today.

VISA/MC accepted
C G GRAPHICS ARTS SUPPLY, INC.

481 Washington Street

New York, N.Y. 10013

(212)925-5332 1(800)342-5858

P.C. Copier & Laser Printer Owners



TONER Service Company

UPS To:
2128 Dolman
St. Louis, MO
63104

We buy empties—\$10.00
Ricoh Compt. Toner Kits—\$44.95 up
314-776-1155/800-88 TONER

MC/VISA & Corporate Accounts Welcome

CIRCLE 282 ON READER SERVICE CARD

SELL US YOUR EMPTY TONER CARTRIDGES \$10

- \$6.50/cartridge • \$3/used fiber cleaner • \$50/bulk order
- PRINTERS: HP series 1&II, Apple, Canon, QMS, NEC...
- COPIERS: Canon PC models 10, 14, 20 and 25.
- You pay shipping for empties. Ship in orig. box & wrap.

BUY OUR REFILLED CARTRIDGES

- BLACK: \$40 (\$50 w/o) BLUE/BROWN: \$40 (\$70 w/o)
- We pay shipping • Over 20% more toner than new.
- Quality Control sheet and felt cleaner included.
- Fast nationwide cartridge refiller. • PCUSER 12/14/86 p16

MICHLIN COMPUTER CONSULTANTS INTL
LASER CARTRIDGE DIVISION
3770 Plaza Drive Suite 2
Ann Arbor, Michigan 48106-7154
VISA/MC/P.O. welcome
313-663-9800 TELEX 98-1530
905-63-1000W FAX 313-663-9802
An in-house of exchanged cartridge product

CIRCLE 284 ON READER SERVICE CARD

MacUser Marketplace

To place your add call

(212) 503-5115 or (800) 825-4ADS

ORDER YOUR MISSING COPIES OF MACUSER TODAY!



Limited quantities of MacUser back issues are available to complete your Macintosh documentation library. Just send \$7.00 (check or money order) for each back issue ordered (\$8.00 in Canada and all other foreign countries, U.S. currency) to:

MacUser

Ziff-Davis Publishing Company
P.O. Box 5999, Cherry Hill, NJ 08034
Attn: F. Hunter

Be sure to include month and year of each issue ordered.

For availability of issues call:

1-609-354-4975

COPY II[®] for Apple Macintosh

7 ver.

Copy II for the Macintosh is a collection of three utility programs and a new desk accessory, Locate. Copy II combines powerful utilities which enable you to: maintain and repair your floppy and hard disks, create archival backups and allow you to install applications directly onto your hard disk.

Here is what the experts say: "It's a well-rounded collection of useful disk utilities that no Macintosh user should be without."

John Gillett
Macworld 5/89

and

"... Copy II is now a utilities package whose components are powerful, useful, and, best of all, easy to use."

Jake Paden
MacUser 3/89



SEARCH AND FIND

Locate is a fast information finder in a desk accessory. You can search for full or partial file names, up to three key words, or both. Once found, Locate displays the information and under Multifinder will launch the application.

Requirements: Mac 512e, MacPlus, Mac SE, Mac II. Supports H.F.S., M.F.S., 400K and 800K disks, 1 or 2 drives, hard disks and all available memory.

To Order: see your local dealer.

\$39.95

Central Point Software

INCORPORATED

- Founded in 1981 -

15220 N.W. Greenbrier Pkwy., #200
Beaverton, OR 97006 USA
503/690-8090

Please circle 15 on reader service card.

Why does ATF Classic TypeTM have Optical ScalingTM?

For visually consistent type at any size.

Small sizes require thicker strokes, larger serifs, some expansion and more space between characters.
Large sizes require thinner strokes, smaller serifs, some condensation with less space between characters.

ATF Optical ScalingTM

6 point

18 point

90 point

Magnified view for comparison.

Optical Scaling available only from ATF.

ATF Classic Type. 180 years of quality!

Kingsley/ATF Type Corp. Software Division
2559-2 E. Broadway Tucson, AZ 85716 • (800) 289-TYPE



Please circle 40 on reader service card.

WHY MORE PEOPLE WILL BE BUYING MACINTOSH PRODUCTS...

For dealers only. MacUser magazine and Ingram Micro D have joined forces to offer resellers the *Macintosh Pocket Selling Guide*. It's a pocket-sized reference guide packed with everything a salesperson needs to better explain today's advanced Mac Products.

Some of the Guide's features include:

- A complete listing of MacUser's highly-respected MiniFinders. These capsule reviews have long been used by retailers to guide buyers in their product purchase decisions.
- A complete industry directory that lists support information for every Macintosh vendor.
- A complete glossary that defines many of the commonly-used terms in the Macintosh market.

More power to you.

The most powerful part of the PSG is the "Sales Briefs." Eye-catching pages that summarize the most important facts about individual products, enabling a salesperson to quickly pass on vital information to potential buyers. You'll make more sales using the "Sales Briefs."

If you would like more information about the MacUser/Ingram Micro D *Pocket Selling Guide*, contact Ingram Micro D.

Changing your mailing address?

It's a simple procedure to ensure that your next issue of MacUser will catch up with you as soon as you move.

Please send your NEW address PLUS your current mailing label to:

MacUser
P.O. Box 56986
Boulder, Colorado
80322-6986

Please allow up to 60 days for change of address to take place.

COMING SOON

On a Gray Scale of 10

MacUser Labs compares 10 large-screen gray-scale display systems and shows you what to look for when you buy.

The Laptop of Luxury

It's almost here! Apple's heavyweight lightweight has been the focus of gossip and rumors for more than a year. Is it worth the wait? Is it worth the weight? Is it worth its weight in gold?

Painters' Showcase

We compare PixelPaint II, Studio/8, Modern Artist, Photon Paint, and Cricket Color Paint and enlist the help of artists to compare their easel of use.

Color Scheme

Apple's QuickDraw jumps from 8 to 32 bits. We'll tell you what those 16.7 million colors can do for you.

Step 1: Read This Article

The first step to successful project management is choosing the right software package.

Of Mice and . . .

. . . trackballs, drawing tablets, touch-screens, and other alternative input devices. See which are best for speed, accuracy, ease of use, and just plain fun.

PLUS

Paul Somerson on the state of the Mac. John Overak on the state of the muck. Louise Kohl's insights on the industry. Robert Wiggins with the corporate perspective. Jim Seymour on the Mac and MIS. Michael Swaine on Beating the System. Freff's Rhythm 'n' Views. What's new in DTP, connectivity, and hypermedia. Reviews of the hottest new hardware and software. Plus more Power Tools, hints and tips from readers, and answers from the Mac team.

MacUser

FINE-PRINT WEASEL

The editors absolutely reserve the right to publish none, some, all, or just the parts we've managed to complete of the above, owing to the inherent problems that occur when reviewing software, hardware, and the ever-elusive vaporware.



Every week our subscribers take cheap shots at each other.

The GENie™ service lets you take your best shots without shooting your budget. That's because our non-prime time rates are good and low. In fact, it's just \$6 an hour for 1200 baud access.*

And that means more time for more fun and games. Exciting multiplayer games like Air Warrior, Stellar Emperor, Orb Wars and Gemstone. Where you can test your skills against some of the best in the world.

Plus enjoy classics like chess, checkers, backgammon, black jack and Reversi. At rates so good you're sure to come out a winner.

And with GENie signing up is as easy as one, two, three.

- (1) Set your modem for local echo (half duplex), 300 or 1200 baud.
- (2) Dial 1-800-638-8369. When you are connected, just enter HHH.
- (3) At the U#= prompt simply enter XTX99644, GENie then RETURN.

And have a major credit card or your checking account number ready. For information in the U.S. or Canada, call 1-800-638-9636. Or write GE Information Services, 401 North Washington St., Rockville, MD 20850.



We bring good things to life.

*Applies only in U.S. Mon.-Fri. 6PM-8AM local time and all day Sat., Sun., and national holidays. Subject to service availability. Some services may be subject to a surcharge. Prices effective May 1, 1989.

AD INDEX

RS#	ADVERTISER	PAGE	RS#	ADVERTISER	PAGE	RS#	ADVERTISER	PAGE
136	Abacus	146	NA	Intuit	45	78	Optimal Technology	66
66	Abaton	47	3	Iomega	246	NA	Oracle	21
NA	Acius	172	31	Irwin Technologies	144	155	Orange Micro	35
NA	Adobe	170	88	Insignia	66	17	Orange Micro	88
NA	Adobe	301	59	James River	248	16	Orange Micro	6
61	Allan Bonadio	199	60	Jasmine	36	146	Pantone	176
71	Alsoft	28	49	Jasmine	226	77	Paracomp	192
159	Altsys	162	45	Jasmine	C6	107	Paragon Concepts	235
NA	Apple	7	161	Kennect Inc.	134-135	58	Passport	249
98	Ashton Tate	90-91	145	Kensington	264	47	Peripheral Land	116
162	Auto Desk	182-183	144	Kensington	118-119	46	Peripheral Land	174
42	Avery	46	40	Kingsley	293	68	Personal Training	177
180	BDT	262	75	La Cie	209	30	Pinnacle Micro	69
116	CDA Computer Sales	252	181	Laser Connection	124	62	Programs Plus	70-75
15	Central Point	293	106	Layered Inc.	154	188	Prometheus	157
157	Centron	299	76	Liberty Systems	252	22	Provue Development	147
NA	Claris	112	1	Liquid Light	230	124	Qualstar	269
119	Compuserve	169	160	Logitech	266	87	Quark	242
36	Computer Friends	276	86	Mac Friends	113	178	Qume	202
101	Connectix	117	82	Mac Friends	175	179	Qume	202
147	Cricket Software	215	NA	Mac Zone	140-143	141	Radius	24-25
24	CTA	150	NA	MacConnection	10-19	NA	RasterOps	64-65
33	Dantz Development	83	50	MacLand	277	12	S.P.S.S.	148
72	Data Translation	187	28	MacProducts USA	126	150	Safeware	276
189	Data Viz	259	39	Macro Mind	156	NA	Seagate	200
5	Dayna Communications	256	165	MacStore	276	NA	Seybold	258
80	Deneba Software	5	13	MacWarehouse	52-59	158	Sharp	224
53	Design Science	155	50	MacWork Shops	38	149	Sigma	29
84	Diehl	197	54	Magna Corporation	127	172	Silicon Beach	244
11	Digital Vision	153	NA	Magnavox	168	32	Software Excitement	279
120	Diskette Connection	278	2	Mainstay	260	152	Software That Fits	274-275
126	DPI	108	184	Mass Micro	303	63	Software Ventures	77
170	Dr. Mac	273	122	Mass Micro	32	163	Solutions Int'l	240-241
109	Dubl Click	269	187	MathSoft	216	37	Sun Remarketing	84
110	Dubl Click	258	114	Maxcell	220	NA	SuperMac	40-41
18	E-Machines	159	115	Merrit	267	NA	SuperMac	39
20	E-Machines	161	123	Micro Planner	305	NA	SuperMac	153
131	Ehman Engineering	115	81	Micron Technology	238	NA	SuperMac	155
128	Electronic Arts	128	143	MicroNet	152	85	Supra	270
NA	Farallon Computing	254-255	NA	Microsoft	C2-C4, 1	156	Symantec	26
182	FWB Software	237	NA	Microsoft	106-107	92	Symantec	23
97	GCC Technologies	99	NA	Microsoft	234	148	Synergy	299
99	GCC Technologies	101	90	Microsoft Press	34	29	T/Maker	C5
104	GCC Technologies	103	133	Microtech Int.	131	171	Tektronix	193
105	GCC Technologies	105	134	Microtech Int.	132-133	165	Thunderware	22
NA	GEISCO	295	89	Miro Data	253	NA	TOPS	9
135	GW Instruments	20	83	Mirror Technologies	110-111	70	True Vision	163
168	Hard Disk Drives Int'l	186	164	Mitsubishi	211	NA	Unimac	228
21	Hewlett Packard	79-81	100	Monogram	42	38	Varietyper	164
154	IDD	86-87	19	MSI	267	103	Versacad	236
14	Infocus	38	166	NEC	30-31	140	Vertical Solutions	196
197	Informix	205	56	New Com Link	44	118	White Pine Software	269
198	Informix	207	48	Niles And Associates	267	73	Xerox SIS	232
111	Infosphere	263	102	Nuvotech	250	55	Zipatone	114
69	Insight Development	218	137	Odesta	96-97			

MacUser

COMPLETELY FREE!**NO COST!****NO OBLIGATION!**

FREE INFORMATION

ON PRODUCTS AND SERVICES
ADVERTISED IN MACUSER

Here's how to get more information on products and services advertised in this issue: 1.) Find the reader service number for the product(s) that interest you in our Ad Index, and circle the number(s) on this card. 2.) Fill in your name and address and drop the card in the mail. Information will be sent to you directly from the advertiser.

NAME	TITLE	
COMPANY		
ADDRESS		
CITY	STATE	ZIP
PHONE		

CIRCLE FOR FREE INFORMATION

VOID AFTER DECEMBER 31, 1989

001 002 003 004 005 006 007 008 009 010
031 032 033 034 035 036 037 038 039 040
061 062 063 064 065 066 067 068 069 070
091 092 093 094 095 096 097 098 099 100
121 122 123 124 125 126 127 128 129 130
151 152 153 154 155 156 157 158 159 160
181 182 183 184 185 186 187 188 189 190
211 212 213 214 215 216 217 218 219 220
241 242 243 244 245 246 247 248 249 250
271 272 273 274 275 276 277 278 279 280

011 012 013 014 015 016 017 018 019 020
041 042 043 044 045 046 047 048 049 050
071 072 073 074 075 076 077 078 079 080
101 102 103 104 105 106 107 108 109 110
131 132 133 134 135 136 137 138 139 140
161 162 163 164 165 166 167 168 169 170
191 192 193 194 195 196 197 198 199 200
221 222 223 224 225 226 227 228 229 230
251 252 253 254 255 256 257 258 259 260
281 282 283 284 285 286 287 288 289 290

021 022 023 024 025 026 027 028 029 030
051 052 053 054 055 056 057 058 059 060
081 082 083 084 085 086 087 088 089 090
111 112 113 114 115 116 117 118 119 120
141 142 143 144 145 146 147 148 149 150
171 172 173 174 175 176 177 178 179 180
201 202 203 204 205 206 207 208 209 210
231 232 233 234 235 236 237 238 239 240
261 262 263 264 265 266 267 268 269 270
291 292 293 294 295 296 297 298 299 300

☐ Please send me a one year subscription to MacUser for \$19.97. I'll save 58% off the newsstand price of \$35.40. Annual basic subscription price is \$27.00. Offer valid in U.S. only.

MU9893

MacUser

COMPLETELY FREE!**NO COST!****NO OBLIGATION!**

FREE INFORMATION

ON PRODUCTS AND SERVICES
ADVERTISED IN MACUSER

Here's how to get more information on products and services advertised in this issue: 1.) Find the reader service number for the product(s) that interest you in our Ad Index, and circle the number(s) on this card. 2.) Fill in your name and address and drop the card in the mail. Information will be sent to you directly from the advertiser.

NAME	TITLE	
COMPANY		
ADDRESS		
CITY	STATE	ZIP
PHONE		

CIRCLE FOR FREE INFORMATION

VOID AFTER DECEMBER 31, 1989

001 002 003 004 005 006 007 008 009 010
031 032 033 034 035 036 037 038 039 040
061 062 063 064 065 066 067 068 069 070
091 092 093 094 095 096 097 098 099 100
121 122 123 124 125 126 127 128 129 130
151 152 153 154 155 156 157 158 159 160
181 182 183 184 185 186 187 188 189 190
211 212 213 214 215 216 217 218 219 220
241 242 243 244 245 246 247 248 249 250
271 272 273 274 275 276 277 278 279 280

011 012 013 014 015 016 017 018 019 020
041 042 043 044 045 046 047 048 049 050
071 072 073 074 075 076 077 078 079 080
101 102 103 104 105 106 107 108 109 110
131 132 133 134 135 136 137 138 139 140
161 162 163 164 165 166 167 168 169 170
191 192 193 194 195 196 197 198 199 200
221 222 223 224 225 226 227 228 229 230
251 252 253 254 255 256 257 258 259 260
281 282 283 284 285 286 287 288 289 290

021 022 023 024 025 026 027 028 029 030
051 052 053 054 055 056 057 058 059 060
081 082 083 084 085 086 087 088 089 090
111 112 113 114 115 116 117 118 119 120
141 142 143 144 145 146 147 148 149 150
171 172 173 174 175 176 177 178 179 180
201 202 203 204 205 206 207 208 209 210
231 232 233 234 235 236 237 238 239 240
261 262 263 264 265 266 267 268 269 270
291 292 293 294 295 296 297 298 299 300

☐ Please send me a one year subscription to MacUser for \$19.97. I'll save 58% off the newsstand price of \$35.40. Annual basic subscription price is \$27.00. Offer valid in U.S. only.

MU9892

MacUser

COMPLETELY FREE!**NO COST!****NO OBLIGATION!**

FREE INFORMATION

ON PRODUCTS AND SERVICES
ADVERTISED IN MACUSER

Here's how to get more information on products and services advertised in this issue: 1.) Find the reader service number for the product(s) that interest you in our Ad Index, and circle the number(s) on this card. 2.) Fill in your name and address and drop the card in the mail. Information will be sent to you directly from the advertiser.

NAME	TITLE	
COMPANY		
ADDRESS		
CITY	STATE	ZIP
PHONE		

CIRCLE FOR FREE INFORMATION

VOID AFTER DECEMBER 31, 1989

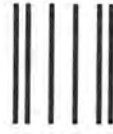
001 002 003 004 005 006 007 008 009 010
031 032 033 034 035 036 037 038 039 040
061 062 063 064 065 066 067 068 069 070
091 092 093 094 095 096 097 098 099 100
121 122 123 124 125 126 127 128 129 130
151 152 153 154 155 156 157 158 159 160
181 182 183 184 185 186 187 188 189 190
211 212 213 214 215 216 217 218 219 220
241 242 243 244 245 246 247 248 249 250
271 272 273 274 275 276 277 278 279 280

011 012 013 014 015 016 017 018 019 020
041 042 043 044 045 046 047 048 049 050
071 072 073 074 075 076 077 078 079 080
101 102 103 104 105 106 107 108 109 110
131 132 133 134 135 136 137 138 139 140
161 162 163 164 165 166 167 168 169 170
191 192 193 194 195 196 197 198 199 200
221 222 223 224 225 226 227 228 229 230
251 252 253 254 255 256 257 258 259 260
281 282 283 284 285 286 287 288 289 290

021 022 023 024 025 026 027 028 029 030
051 052 053 054 055 056 057 058 059 060
081 082 083 084 085 086 087 088 089 090
111 112 113 114 115 116 117 118 119 120
141 142 143 144 145 146 147 148 149 150
171 172 173 174 175 176 177 178 179 180
201 202 203 204 205 206 207 208 209 210
231 232 233 234 235 236 237 238 239 240
261 262 263 264 265 266 267 268 269 270
291 292 293 294 295 296 297 298 299 300

☐ Please send me a one year subscription to MacUser for \$19.97. I'll save 58% off the newsstand price of \$35.40. Annual basic subscription price is \$27.00. Offer valid in U.S. only.

MU9891



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 33854 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE

MacUser

P.O. Box 40008
Philadelphia, PA 19106-9866



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 33854 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE

MacUser

P.O. Box 40008
Philadelphia, PA 19106-9866



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 33854 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE

MacUser

P.O. Box 40008
Philadelphia, PA 19106-9866



WHY MORE PEOPLE WILL BE BUYING MACINTOSH PRODUCTS...

For dealers only. MacUser magazine and Ingram Micro D have joined forces to offer resellers the Macintosh Pocket Selling Guide. It's a pocket-sized reference guide packed with everything a salesperson needs to better explain today's advanced Mac Products.

Some of the Guide's features include:

- A complete listing of MacUser's highly-respected MiniFinders. These capsule reviews have long been used by retailers to guide buyers in their product purchase decisions.
- A complete industry directory that lists support information for every Macintosh vendor.
- A complete glossary that defines many of the commonly-used terms in the Macintosh market.

More power to you.

The most powerful part of the PSG is the "Sales Briefs." Eye-catching pages that summarize the most important facts about individual products, enabling a salesperson to quickly pass on vital information to potential buyers. You'll make more sales using the "Sales Briefs."

If you would like more information about the MacUser/Ingram Micro D Pocket Selling Guide, contact Ingram Micro D.

Click into Casino Excitement

CASINO GAMES THAT GIVE YOU THE SKILL FOR THE WINNING EDGE. Recommended and used by professional gamblers. Play and learn at your own pace with no risk. Make all casino bets with player-selectable stake, chip value, and rules options. Windows help with payoff odds and advice. Manuals contain complete rules and betting strategies. Tens of thousands of satisfied customers. Designed for Mac's with 512K including Mac II. Not copy protected.

CRAPS MASTER™ Casino craps give skilled players nearly the same advantage as the house. All standard bets including multiple Odds and Place bets.

ROULETTE MASTER™ The croupier sliding over your winnings is the only thing missing from our realistic Casino Roulette game. Play Double 0 or Single 0. Repeat bets with single entry.

BACCARAT MASTER™ Feel what it is like to be a high-roller in the ultimate casino game. Play one to three hands with unlimited betting. Repeat bets with single entry.

CRAPS MASTER™ ROULETTE MASTER™ BACCARAT MASTER™ BLACKJACK ACE™ AND POKER MASTER™ ARE TRADEMARKS OF CENTRON SOFTWARE, INC.



BLACKJACK ACE™ Blackjack is the one casino game where skill and knowledge can practically eliminate the house advantage. Learn card counting using up to eight decks while playing with one to three hands. All standard casino bets, including double, split, and insurance. Repeat bets with a single entry.


POKER MASTER™ No bluffing here! This is an exact simulation of casino video poker. On-screen draw probabilities sharpen your betting skills.

CALL TOLL FREE 1-800-848-2424.

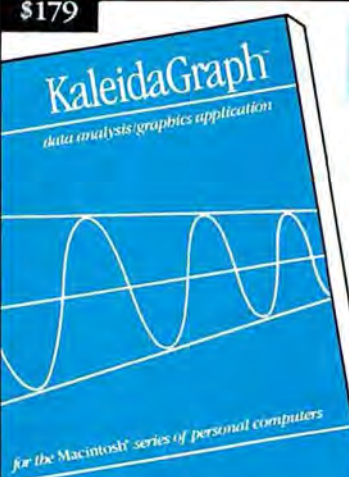
Centron Software, Inc.
7718 LaMirada Drive, Boca Raton, Florida 33433
MASTER THE WINNING EDGE.

Please circle 157 on reader service card.

\$295




\$179




Access text and graphics mainframe applications from one easy-to-use program

■ **EMULATE** industry standard text and graphics terminals, including the DEC VT100, DG D200, Tektronix 4014 and Tektronix 4105 ■ **COMMUNICATE** with a wide variety of mainframe computers or information services ■ **TRANSFER** files using popular protocols, including XModem, YModem and Kermit ■ **BACKGROUND** operation is supported under MultiFinder

developed by  **Abelbeck Software**

Import data, analyze the data, and generate scientific and business graphics from one easy-to-use program

■ **FLEXIBLE** data import facilities ■ **FAST** operation (5 to 20 times faster than Cricket Graph™ version 1.2) ■ **LARGE** data sets supported (32,000 data points per variable) ■ **FEATURES** including: curve fitting; log, linear, polar and probability plots; high-resolution printing ■ **PROGRAMMABLE** RPN Calculator and Algebraic Formula entry.

 **SYNERGY SOFTWARE**
2457 Perkiomen Ave., Reading, PA 19606, 215-779-0522

Please circle 148 on reader service card.

Bobker's Dozen

Good Things and Small Packages

No magazine can review every product released into the Mac marketplace these days. Even if every product were worth a review — and that's a very big if — there are far too many good products. And sometimes some of the smaller products — especially those from less well known companies — get overlooked in the increasingly cluttered marketplace.

Most of the products I'll report on will be regular commercial products. One or two will be shareware or public-domain software, and now and then I'll tell you about products that haven't been released yet but that I've had a chance to take a good look at. Since I'll be telling you what I think about lots of products, it's important that you know my biases. I've been reviewing Mac software since *MacUser's* first issue in 1985. I strongly favor the elegant, the fast, and the useful. I like and use tons of utility software, and I'm not easy to please. Good isn't enough; very good barely earns a place on my hard disk.

Programs that invent their own interface don't get high marks, but I do like programs that improve on the standard interface.

■■■■■■■■■■
By STEVEN BOBKER

1 PictureBook

This month's best product is Loop Software's **PictureBook**. If you use Apple's Scrapbook DA at all, you know what a great idea and how handy it is. You also know that it's pretty limited. Several developers have created enhanced and improved scrapbooks. Most of them are quite good. In fact, Solutions International's SmartScrap won the 1987 Eddy award as the best new DA of 1987 (see "3rd Annual Editor's Choice Awards," February 1988). SmartScrap is a difficult act to beat.

PictureBook does just that, though, snatching the title as the best scrapbook utility. And PictureBook isn't just a scrapbook; it's a format converter, sizing utility, and clip-art cataloger. It does more than any similar program and works smoothly and relatively transparently. It can convert Scrapbook or SmartScrap files into its own format, and it's smart enough to preserve a copy in the original format.

Aside from being a full-featured scrapbook, with facilities for annotating each item and creating useful catalogs, PictureBook has the wonder-

ful ability to resize (to exact pixel precision) anything that can be copied to the standard Mac Clipboard.

Items on the Clipboard can also be cropped with four click-and-drag crop lines, a vast improvement over the more common "drag-the-corner-handle" method. To get precise cropping, you can quickly magnify images and then return them to the original size, after cropping, with a single click.

Here's how much I like

PictureBook: I rename my most-used DAs by putting one or more spaces in front of their names (using Suitcase II or the utilities included with Font/DA Juggler and MasterJuggler). That forces them to the top of the Apple menu and makes them easier to use. I promoted PictureBook to the top soon after acquiring it, a meteoric rise in my system.

Loop Software
P.O. Box 1249
Menlo Park, CA 94026
(800) 288-7631; \$69.95



2 Pyro!

At \$24.95, **Pyro!** is as cheap a stand-alone utility program as you'll find, but don't let its tiny size, tiny price, or tiny package fool you. It's the best screen saver (or blanker) available. Indeed, its main failing is that the fireworks display it produces tends to mesmerize users.

The controls appear in your Control Panel. The latest versions are "intelligent" and can be set to refrain from darkening the screen during, for example, long downloads from BBSs. They also understand and work correctly if you are running a multiple-monitor setup; the fireworks appear only on the main screen, but all auxiliary screens are properly darkened.

Fifth Generation Systems
11200 Industriplex Blvd., Baton Rouge, LA 70809
(504) 291-7221; \$24.95



3 ExpressWrite

ExpressWrite is one of the new breed of word-processing DAs. It (and QuickLetter, the first of this kind, reviewed in the April '89 issue) goes far beyond the text-processing capabilities of the widely used miniWriter and McSink DAs. ExpressWrite is an excellent program and would be the clear choice if only it were able to handle graphics. Unfortunately, this version doesn't. I want my letter-writing DA to be able to handle my letterhead and put some graphics into the return-address area of envelopes.

ExpressWrite *does* handle many more formatting options than QuickLetter, however, and its interface is more intuitive. Its mail-merge abilities rival those of all but the most expensive dedicated mail programs. It just needs to print a bit better and be able to import and use graphics. When that happens, it will be able to replace most light-duty word-processors.

Exodus Software
8620 Winton Road, Suite 304
Cincinnati, OH 45231
(513) 522-0011; \$99.95



IT TAKES A CERTAIN TYPE TO MAKE A STATEMENT THIS BOLD.



Sumner Stone, Adobe's Director of Typography is a pioneer in the world of electronic type. He's the mastermind behind Adobe Originals, our distinctive new designs and typeface revivals that combine the traditions of great typography with the requirements of modern communication.

And Adobe is just the type to do it. As the undisputed leader of the electronic publishing industry, Adobe has the perfect typeface for every communication style—more than 500 downloadable fonts in all.

But there's more to our Adobe® Type Library than just variety. Because we license original typeface designs and painstakingly create them in PostScript® format, the quality simply can't be matched. And our technology assures that every font prints perfectly, regardless of point size or resolution of your PostScript printer.

You'll find that same level of quality in our screen fonts, too. In fact, the new Adobe Type Manager™ allows you to scale Adobe typefaces precisely to any size right on your Macintosh® display.

We've also added the Adobe Originals™, our unique collection of classic and original typefaces specifically designed and produced for today's electronic publishers. They're complemented by extended character sets—available separately—which may include small capitals, oldstyle figures, fractions, ornaments and titling capitals.

For more information about the Adobe Originals and the rest of the Adobe Type Library, send for our free *Font & Function*™ catalog. It's full of tips and techniques by type experts from around the world. With a little help from our catalog, your PostScript printer and your Macintosh or IBM® PC computer, you'll be all set to publish like a pro.

Just mail this coupon for your free copy of *Font & Function*. Or, if you're the type who can't wait, call us at 800-83-FONTS.

To receive your free *Font & Function* Adobe Type Catalog, mail to: Font & Function, P.O. Box 7900, Mountain View, CA 94039-7900.

Check appropriate box(es):

I use a ☐ Macintosh ☐ IBM PC computer.

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone _____

Please allow 4 weeks for delivery.

ADOBE

Font & Function

YOUR
NEW
ADOBE
TYPE
CATALOG
IS HERE.

Adobe, the Adobe logo, PostScript and the PostScript logo are registered trademarks and Adobe Type Manager, Adobe Originals and Font & Function are trademarks of Adobe Systems Incorporated. Macintosh is the registered trademark of Apple Computer, Inc. IBM is the registered trademark of IBM Corporation. ©1989 Adobe Systems Incorporated. All rights reserved.



Look for this symbol on computers, printers and other products that include PostScript software from Adobe Systems. It's your guarantee of quality and compatibility.

4 MugShot

MugShot is a free utility available from the major national electronic services (MAUG on CompuServe, The Mac Roundtable on GEnie, and the Mac forum on MacNet). MugShot creates a report that lists your important system-software data. It also lists all installed DAs, INITs (now more or less officially called

Startup documents), cdevs, and RDEVs. This information is vital for diagnosing software problems; publishers and developers need it to efficiently address your problems. Operation couldn't be simpler. Just launch MugShot and, when its window appears, press the Dump Info button.



Nothing seems to happen, but MugShot, in a flash, creates a text file that contains all the data. The file is named `_Rap Sheet_` (overwriting any existing `_Rap Sheet_` file without warning). If you wish to save the information, rename the `_Rap Sheet_` file as soon you return to the desktop. I recommend that you use the date and your name as the new filename.

MI Concepts
P.O. Box 8822
Kentwood, MI 49508

5 Just Enough Pascal

Symantec's **Just Enough Pascal** is an odd program: It's both a Pascal (Lightspeed Pascal, to be exact) tutor and an excellent introduction to Macintosh programming. (You have to have Lightspeed Pascal to use Just Enough Pascal.)

Just Enough Pascal consists of 20 lessons or stages that lead to a finished small application. By the time you work through all 20 stages — with the help of a short but awesomely well written manual — you'll have a good grounding in both Pascal and Mac

programming.

If you have some knowledge of Pascal on other systems and want to get started in Mac programming, Just Enough Pascal is just the ticket. It's equally good if you understand Mac programming and feel the need to learn Pascal.

Absolute neophytes to both Mac programming and Pascal can also use it, but it isn't really a tutorial program. If you're starting from scratch, there are better ways to do so.

I had put off really delving into Mac programming for a long time, and I had lots of good excuses: no time, too difficult, manuals aimed at folks who already knew what they were doing, and so on. Just Enough Pascal broke my resistance. It's fun to use, the material is broken into intelligently sized chunks, and the manual is a delight. And I'm far more knowledgeable about Mac programming as a result.

Symantec
10201 Torre Ave.
Cupertino, CA 95014; (408) 253-9600
\$75

6 Hermes and Tribune

Doug Miles' **Hermes** and **Tribune** fonts are subtle remakes of Apple's mainstay Helvetica and Times. The line weights are thinned down in the larger sizes. The very big sizes, intended primarily for users who need 3X and 4X sizes for use with ImageWriter LQs, LaserWriter IISCs, and fax modems, are much better than the Apple-supplied equivalents. I was somewhat dubious of the claims in the manuals (yes, these fonts come with nice manuals that you can print out) until I tried them. The improved results were immediately obvious.

There are some very nice touches here. If you use a PostScript printer and have Font Substitution switched on (as you almost always should — On is the default setting in the Page Setup dialog), you get true WYSIWYG performance from these fonts.

A bonus is the inclusion of a special version of 10-point Courier. It's the best match I've ever seen for IBM's 12-pitch Courier typewriter face. If you need to fake the output of an IBM Selectric, this font makes it a snap.

Miles & Miles, 704 N. Water, #1
Elmsburg, WA 98926; (509) 825-5280. \$59.95



7 Screen Gems

Screen Gems is a set of five programs aimed at Mac II users who have color monitors, although the programs also work on color monitors attached to SEs. Some of these programs are so good that Apple or the color-monitor vendors should be the ones providing them.

Dimmer and Switch-a-Roo are basic tools. Dimmer is a different sort of screen saver. Instead of blanking the screen, it dims it to a level you specify. Switch-a-Roo is an Fkey that flip-flops your screen between two monitor settings. For example, you can set the flip to 1-bit black-and-white mode for picky programs and increased speed and then flop to 8-bit (256-color) mode for your works of art. A simple keyboard command equivalent moves you from one to the other.

Color Desk puts a full-color background behind any desktop — pretty, although it can eat up a lot of memory (up to 320K!). Globe is a rapidly spinning colored map of the earth that actually uses round windows. It works perfectly in the background under MultiFinder and makes a very nice demo piece. TN-3 lets you customize the color set that appears on the Finder's Color menu.

Microseeds
7030-B W. Hillisborough Ave.
Tampa, FL 33615; (813) 882-8635
\$79

Desktop De Mille.



Graphics and animation
over live, full-color video



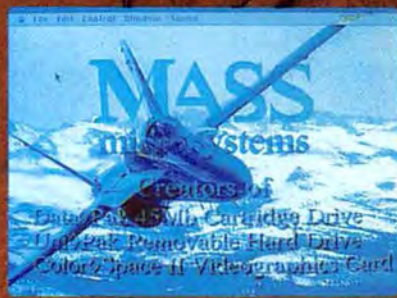
Full-color digitizer
captures video

"Best New
Desktop Video
Product."

— Mac user editors
choice award 1989



Comprehensive,
easy-to-use software



Special effects such
as translucent graphics

So you wanna be in pictures.

Well, with our ColorSpace

II videographics card we'll

put you one step closer to

creating your own multi-

media masterpiece. Color-

Space II allows you to produce full color, professional

quality videotapes and multimedia presentations in-house,

inexpensively, in minutes. Cecil B. should have had it so

good! It's easy to install, uses only one slot in your Mac II

and is fully compatible with all standard Macintosh II

applications including: HyperCard, SuperCard and Director.

Use the ColorSpace II card with *or in place of* your Apple

Video card, *and* in conjunction with other Macintosh II

cards. ColorSpace II is fully NTSC-compatible and works

with a wide range of standard consumer and professional

NTSC and RGB video equipment. In addition, it supports

256 color, flicker-free graphics on RGB multisync-type

monitors.

ColorSpace II™

DESKTOP VIDEO PRODUCTION

ColorSpace II's genlocking

lets you synchronize your

Macintosh graphics to

almost any VCR, videodisc,

or other standard video

signal. Then overlay titling

or graphics — mix the two signals together — and display

or record the results. In no time you'll be creating eye-

popping fly-thru logos and animations over live video.

Other advanced features such as translucent graphics and

dimmed video background are readily selectable with

ColorSpace II's easy-to-use software. And, unlike the com-

petition, ColorSpace II has full RGB-quality mixing of

the video and graphics for superb, simultaneous RGB

and NTSC video output. ColorSpace II can also capture

(digitize) video images from standard NTSC or RGB video

sources in as little as 1 second for full color. So if you

want to be in pictures get ColorSpace II, get an agent

and get famous!

See us at MacWorld Boston,
Booth #1710

Actual unretouched screen shots



Call 800-522-7979 for a dealer
near you and to order your video
of ColorSpace II: Hints and Secrets
of Desktop Video for only \$19.95



550 Del Rey Avenue ♦ Sunnyvale ♦ California 94086 ♦ In Canada call: 604/276-2326
ColorSpace II and MASS Microsystems are trademarks of MASS Microsystems, Inc. Macintosh, Macintosh II and HyperCard are registered
trademarks of Apple Computer, Inc. SuperCard is a trademark of Silicon Beach Software, Inc. Director is a trademark of MacroMind, Inc.

Please circle 184 on reader service card.

8 Calendar-Maker

CalendarMaker was reviewed in these pages long ago. Since then I've been amazed by how many people use CalendarMaker printouts for their personal schedules. That's the ultimate compliment for any application.

CalendarMaker and its bonus utility, Icon Mover, are simple programs. The calendars can be customized with graphics and icons or left mostly blank so you can write information in as required. The all-important printing functions are well done. If you're using an ImageWriter (any flavor), you can specify any paper size you want.

CE Software
P.O. Box 65580
West Des Moines, IA 50265
(515) 224-1995; \$49.95

9 DynoDex

DynoDex isn't out yet, but it's scheduled to be released by about the time this magazine hits the stands. It already looks like my choice for my all-important name-and-address file. DynoDex consists of a nifty little database and some superb print routines that print your files laid out correctly on the front and back of special paper (you flip the pages manually for the printer) that is perforated and punched to fit standard Filofax and Day Runner organizers. Even in prerelease form, this product has elegant written all over it.

Portfolio Systems, 156 Flushing Ave.
Brooklyn, NY 11205; (718) 935-9501
Expected price, \$139

10 Business Plan Toolkit

Business Plan Toolkit is a blessing for entrepreneurs and other businesspeople. It makes the creation of good business plans relatively easy, encouraging their regular use. The excellent manual provides background information and advice as well as instructions.

The actual Toolkit is based on a large set of Excel macros, which are provided in both standard Excel and SYLK formats,

so you can use virtually any spreadsheet. There's also a nice HyperCard stack (containing a lot of boilerplate text) to help you through the text portions of your business plan. Finally, there are some samples in Word 3 and text

formats. Business Plan Toolkit is a nicely integrated package that can make a difficult job significantly easier.

Palo Alto Software
260 Sheridan Ave., #219
Palo Alto, CA 94306; (415) 325-3190
\$99.95

11 SimCity Terrain Editor



The **SimCity Terrain Editor** should have been included with SimCity, the excellent and popular city-planning simulation. The basic program provides only a limited range of maps to build on. The Terrain Editor lets you be a land developer as well as a city planner. You can also duplicate any real terrain.

Operation is simple and

relatively quick. Although you must design in black-and-white, the land you create shows up in 16 colors if you have the color version of SimCity. This add-on makes an already good program substantially more valuable.

Maxis Software
953 Mountain View Drive, Suite 113
Lafayette, CA 94549
\$24.95, directly from publisher only

12 Click-Paste

ClickPaste is a utility that puts a scrapbook function at the tip of your cursor. To use it, simply hold down the Option and Shift keys (or others of your choosing) as you press the mouse button. Up pops ClickPaste. You can now paste the contents of the Clipboard to ClickPaste's special folder or select any previously stored material. ClickPaste works with ordinary text, bit-mapped or object-oriented graphics, PageMaker and HyperCard material, and unclassified material. My only complaint: It stores its files in a folder that must be named Scrap and that must be kept at the root level of your hard disk; that's inelegant. I'd like to be able to place the Scrap folder inside another folder and change the name to something that doesn't make me want to throw it away every time I see it.

Mainstay, 5311-B Derry Ave.
Agoura Hills, CA 91301
(818) 991-6540; \$99.95

13 LANDesign

LANDesign, a versatile land-surveying program, is aimed at a limited audience. Users have many options. Although that's often a drawback, it can also be an advantage: The program lets surveyors operate within the program in the ways they worked before they had a Mac to help them.

The interface is complete and intuitive — even new Mac users should be able to use LANDesign immediately. All standard COGO (coordinate geometry) features are supported, and all objects can be named with both character identifiers and labels.

The program is intelligent; for example, it completes polygons automatically. It can also do elaborate dimensioning. I was particularly impressed by the excellent design of the interface and overall elegance of this very complex program.

Compuneering, 113 McCabe Crescent, Thornhill, Ontario L4J 2B6
Canada; (416) 738-4801. \$595



Ever feel like your project is managing you?



You're behind schedule, over budget, and out of excuses. Suddenly, your project's become a monumental drag. What do you tell the boss?

Help is on the way.
With MICRO PLANNER, the powerful project

manager that makes even complex projects a snap.

In less than a day, MICRO PLANNER's unique graphic interface will have you building a step-by-step model of your project. From there, Critical Path Method will calculate start dates and deadlines,

forecast bottlenecks, and optimize crucial resources. Then you'll create impressive reports—including PERT charts and bar charts—that look as powerful on paper as on the screen.

PC or Mac™, you're ready for take off.

Identical on PCs or Macs, MICRO PLANNER automatically converts files between machines. Which keeps everyone in your company pulling together.

Show your project who's boss with MICRO PLANNER.

Call Micro Planning International at (415) 788-3324 for your nearest dealer.

**MICRO
PLANNER**
Planning for Success.

Please circle 123 on reader service card.

DEVIL'S ADVOCATE

T

he planet was called Esnesnon, and the popularity of the small computer was all that anyone talked about. For years a company called Apple Creative Machines dominated the computer scene. Apple became one of Esnesnon's largest corporations when it developed the Apple 370 back in the 1960s or so. Nobody had come close to matching Apple, despite the ridicule the company received for its tactics and policies.

Apple took a low-key approach to selling that somehow appealed to the citizenry of Esnesnon, a planet known mostly for formality and ritual. It was a rare sight, indeed, when an



Visit to a Backward Planet

Esnesnonian was seen without the usual dark-blue suit, white shirt, and conservative red tie. But Apple persisted in requiring its employees to wear loose collars, sport coats, and baggy pants. The company thought this distinction was partly responsible for its becoming the biggest company in the galaxy.

Then it happened. Some entrepreneurs in the desert put together a desktop computer called the Rialto, using a micro-computer chip. The event was pooh-poohed by Apple in spite of the fact that a whole slug of little companies cropped up, including one called IBM (Itty Bitty Machines).

A couple of years passed, with most of the machines modeled after the big Apple mainframes: They all had the mouse and the graphical icon-based interface and clear screens with millions of colors. Nobody took the machine's power seriously.

Then it happened. IBM's Watt Tomson decided to take a chance with some technology that he had found at Canon's Los Altos Research Center (LARC). (Canon was the company that invented the Canographical copying machine that made billions of dollars.) Unfortunately, the company languished as a monopoly and was later overshadowed by Xerox and other aggressive firms in that industry. Nonetheless, Canon maintained a stunning research facility to develop products that would never see the light of day. Apparently the CEO, a man who always wore a fez and called himself Natalie, was quite superstitious and refused to ever market a new product. He decided instead to buy healthy firms and find ways to make them go broke as part of some religious ritual. So the research was there for the taking.

Some sort of secret deal was made, and Tomson ended up with the interface of the future: the command-line interface and the A> prompt. It was revolutionary. Nobody had seen anything like it. It was easy to use: You just told the computer what you

wanted to do, using easy-to-remember commands that were listed in a small book. Thus began the first 100 days of the revolutionary new IBM PC. Fanatics came on the scene extolling the superiority of the command-line interface. The litany was always the same: It was faster; it didn't need a mouse; it was more efficient; it was easier to use than a complicated graphics-based interface. Most importantly, it was cheaper to build.

Magazines appeared. The A> prompt symbol was made into a flag and flown over the West Coast manufacturing plant for the PC. The command liners were all considered crackpots, weirdos, and screwballs.

In the interim, Apple, on a lark, built a low-priced microcomputer called the Macintosh. It sold like hotcakes if for no other reason than that it was made by Apple. But within a few years, sales lagged as Apple clones and the world demand for the command-line interface took its toll on the company. So Apple met with billionaire software guru Gil Bates, who was cajoled into copying the PC idea and designing a new operating system and interface similar to the command-line interface on the PC.

Bates and his hordes of programmers worked and worked. Weeks went by. Months went by. Years went by. Finally, the company unveiled Blinders, the new operating-system shell for the Mac. Apple thought it was a good start. It was a command-line interface all right, but before you could give it a command, you first had to position the cursor on the command line with the mouse. "Kind of clunky," shouted the critics. Worse, it was slow. Nobody used the product, so, a year later, Bates unveiled Blinders 2.0. "Hurrah!" the critics shouted. It no longer needed the cumbersome mouse. And it was noticeably faster.

IBM, meanwhile, revealed that a sweet deal between Tomson and Bates had resulted in some sort of agreement that allowed Bates and Apple to use some proprietary tricks that IBM had invented. But they could use them only for version 1.0 of Blinders, not 2.0. So IBM sued Apple and Bates.

The user community was upset by this turn of events. After all, everyone now agreed that the command-line interface was the interface of the future. There was no turning back; the graphical interface with all its icons, crazy Command keys, and clumsy mouse was doomed. Lawsuits would harm progress.

Even an old minicomputer operating system, EUNUCHS, developed from the outset with a graphical user interface, was given new life when a shell was developed that allowed it to use simple commands. Some of the commands were only one character long. "What power!" shouted the critics. It was amazing to witness the hitherto unimaginable power of a single keystroke.

The rest is history. The command-line interface became the interface of Esnesnon. Rumor had it that some graphical-user-interface diehards fled to a planet in a distant galaxy to reestablish the graphical interface as a standard.

Right. That'll be the day. ☞



BY JOHN C. DVORAK

The Right Choice... WriteNow.



"BEST NEW WORD PROCESSOR"

—MacUser Magazine, May 1989

"READER'S CHOICE"

—MACazine, January 1989

"GOLDEN GAVEL AWARD"

—MacGuide, Winter 1988



AWARDS & RECOGNITION

WriteNow is the highest-rated word processor in the Macintosh world. MacUser Magazine said it best—*"WriteNow wins best new word processor hands down."*





EASY-TO-LEARN, EASY-TO-USE

If we were to pick one word that our customers use to describe WriteNow, it's *usable*. A great word processor is more than just a stockpile of features—it's the *usability* of those features, how easy they are to learn and use, and how they feel under your fingertips when doing *real work*. Everyone claims ease-of-use, but WriteNow actually delivers it—and our awards and ratings prove it.

BUSINESS POWER & PERFORMANCE

WriteNow has all the power business users need, including: Mail merge; 100,000 word spelling dictionary; multiple columns; in-line graphics; format accelerators (style sheet equivalents); outline indenting, character and word counting, fixed and flexible line spacing, and much more. As important, WriteNow is the fastest word processor in the Mac world, whether you've got a small Mac 512KE or a loaded Mac IIcx.



	<i>Copy & paste large area</i>	<i>Search for a word</i>	<i>Spell check document</i>	<i>Change indents & double spacing</i>	<i>Undo ruler changes</i>
 WriteNow 2.0	6.7 sec.	2.9 sec.	7.4 sec.	23.3 sec.	1.6 sec.
 MacWrite II	45.9 sec.	40.2 sec.	33.6 sec.	44.7 sec.	24.7 sec.
 MS Works 2.0	1 min. 50.8 sec.	35.7 sec.	5 min. 13.4 sec.	2 min. 24.1 sec.	1 min. 14.5 sec.
 MS Word 4.0	21.6 sec.	11.0 sec.	3 min. 55.1 sec.	39.4 sec.	25.8 sec.

All tests performed starting with a 12-page text document on a Macintosh Plus with a 20 megabyte hard disk. Full regeneration performed when necessary.

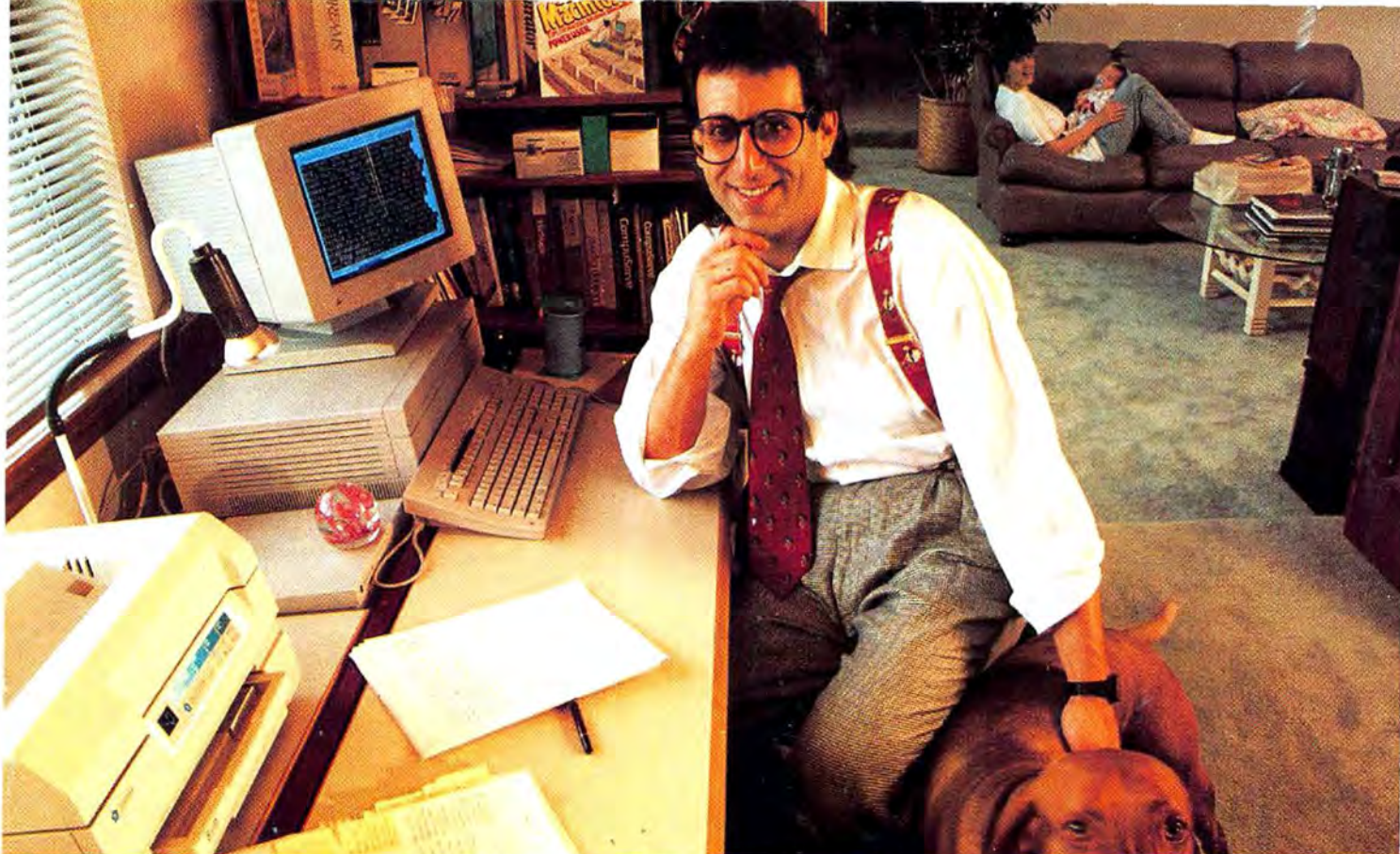
© 1989 T/Maker Company. All rights reserved. The following are registered and unregistered trademarks of the companies listed: WriteNow, licensed to T/Maker Co. Macintosh, Apple Computer, Inc.; MacWrite, Claris Corp.; Microsoft, Microsoft Corp.



T/Maker.

For more information:
T/Maker Company
1390 Villa Street
Mountain View • CA • 94041
Telephone: (415) 962-0195
FAX: (415) 962-0201

Please circle 29 on reader service card.



Bob LeVitus, former editor of MACazine, author of Dr. Macintosh: Tips, Techniques, and Advice for Mastering Your Macintosh.

“The Jasmine DirectPrint is not as good as a laser printer. It’s better.”

“Ever since the day they came out, I’ve been using PostScript® laser printers. I edited a magazine that was desktop-published from cover to cover, so I lived and died by laser printers daily. Over the last three years, I’ve had experience with at least 15 or 20 different models. And the Jasmine DirectPrint™ is better than any of them.

“It’s the fastest, most capable, most reasonably-priced 300-dot printer I’ve ever seen. Text and graphics are clear, sharp, and vivid, and the black and gray tones are incredibly rich. And the amazing thing is, it’s not even a laser printer, but uses liquid crystal technology that requires fewer moving parts. So I expect to have fewer problems with it.

“I’ve been using this printer for proofing all of the drafts of my new book. I’ve thrown some pretty complex PostScript graphics at it, using programs like FreeHand™ and Illustrator88™, and nothing I’ve created has slowed

it down in the least. There’s no question in my mind that the DirectPrint is as fast or faster than even Apple’s® fastest laser printer.

“Another thing I like about the DirectPrint is that it’s about half the size of any laser printer, and actually fits on my desk. And it’s only \$3495, so it fits within this freelance writer’s budget, too. In fact, if I make any more flattering statements about the DirectPrint, people will think I’m taking up a second career as an ad copywriter!”

 **Jasmine**
1-800-347-3228



The proof is in the printing.

Please circle 45 on reader service card.

© 1989 Jasmine Technologies, Inc. 1740 Army Street, San Francisco, CA 94124 Phone 1-415-282-1111 Worldwide. DirectPrint is a trademark of Jasmine Technologies, Inc. Illustrator88 is a trademark of, and PostScript is a registered trademark of, Adobe Systems, Inc. Freehand is a trademark of Aldus Corporation. Apple is a registered trademark of Apple Computer, Inc.